Order Zeoidei

Maxillary strongly protractile. No supramaxillary. Teeth small, in narrow bands, in single series, in pairs and sometimes on vomer and palatines. Branchiostegals 4 to 8. Pseudobranchiae present. Air bladder without open duct (physoclistic). No orbitosphenoid. No mesocoracoid. Scales small or rudimentary, or with bony plates, or vertically elongated. One dorsal, with well developed spinous fin, which may be separated from soft. Anal spines few, more or less separated from soft rays. Caudal rounded or truncate, rarely slightly emarginate.

Fishes known by the high or deep and strongly compressed body. Their distribution world wide, living in the deeper waters of the ocean. They have affinities with certain flounders, their increased ventral rays characteristic of beryciod fishes and the adnate post-temporal as in the boar fishes and the chaetodonts.

Family Zeidae

Body short, deep, greatly compressed, elevated. Eye high, lateral. Mouth large, terminal. Upper jaw protractile. Teeth small, in narrow bands or uniserial in jaws, vomer and sometimes palatines. Opercle much reduced. Some bones of head usually with spines. Preopercle not serrate. Gill openings wide, membranes little united, free from isthmus. Gills 4, slit behind fourth. Gill rakers usually short. Pseudobranchiae large. Branchiostegals 7 or 8. Vertebrae 31 to 40. Pyloric appendages exceedingly numerous. Air bladder large. Body naked or covered with minute smooth scales, or with bony protuberances. Ventral edge often serrate, with strong bony plates.

Lateral line concurrent with back. Dorsal emarginate or divided, front part with spines, often strong. Second dorsal longer, highest rays behind middle. Soft anal like soft dorsal, usually preceded by 1 to 4 spines, not graduated, often forming separate fin. Caudal rounded, on moderate caudal peduncle. Pectoral small. Ventral thoracic, well developed, with spine and 6 to 8 rays.

Fishes of warm seas, variable with age and some living at considerable depths. Genera about 11.

Analysis of Genera

a.' Jeinae. Dorsal spines long, followed by distinctly long separate terminal filament, spines always higher than soft rays.

b.' Anal spines 4; bony plates at second dorsal and anal bases. Zeus.

b.² Anal spines 3; bony plates at bases of both dorsals and anals. Zenopsis.

Synopsis.

a.² Cyttinae. Dorsal spines short, usually shorter than soft rays, rarely with long terminal filaments.

c.' Dorsal spines with long filaments, but little less than body-depth.

Upsaurus latus (not Houttuyn) Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, 1903, p. 355 (Tsuan, Formosa). 1/m

Jordan and Richardson, Mem. Carnegie Mus., vol. 4, no. 4, Aug. 26, 1907, p. 107 (Tsuan).

Diplodus microfasciatus (not Reyen) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 234 (Dekagon Bay).

Depth 2 1/5 to 2 1/2; head 3 to 3 1/2, width 1 7/8 to 2. Snout 2 1/4 to 2 2/3 in head; eye 3 1/6 to 4 1/2, 1 7/8 to 2 1/5 in snout, 1 1/6 to 1 4/5 in interorbital; maxillary to eye in young, 1/2 in eye with age, expansion 1 1/2 to 2 1/5 in eye, length 2 2/5 to 2 3/5 in head; 6 front incisors in each jaw, sometimes 8 below; upper molars triserial, lower biserial; interorbital 2 3/4 to 3 in head, broadly convex. Gill rakers 7+10, lanceolate,

d.' Ventral fin less than head; depth 1 4/5. Cyttus.

d.² Ventral fin 1 1/3 in fish without caudal; depth 1. Rhombocyttus.

c.² dorsal spines low, usually lower than soft rays.

e.' Body without large cone like projections on back and belly.

f.' Belly without scutes.

g.' Vomerine teeth present.

h.' Scales cycloid. Zenion.

h.² Scales ctenoid, adherent.

i.' No enlarged scales.

j.' Ventral use of eye. X.

k.' Scales 40 to 58. Cyttomimus.

k.² Scales 82 to 104. Neocyttus.

i.² With enlarged scales. Allocyttus.

g.² No vomerine teeth.

d.' Ventral fin less than head; depth 1 4/5. Cyttus.

d.² Ventral fin 1 1/3 in fish without caudal; depth 1. Rhombocyttus.

c.² dorsal spines low, usually lower than soft rays.

e.' Body without large cone like projections on back and belly.

f.' Belly without scutes.

g.' Vomerine teeth present.

h.' Scales cycloid. Zenion.

h.² Scales ctenoid, adherent.

i.' No enlarged scales.

j.' Ventral size of eye. ..... V.

j.² Ventral more than half of fish without caudal. Cyttula.

i.³ With enlarged scales. Allocyttus.

g.² No vomerine teeth.

Izuka and Matsumura, Cat. Zool. & Spec. Tokyo Mus.,
Vertebr., 1920, p. 149 (Tsus, Ise).

l.' Preorbital narrow; enlarged, rough, knob-like scales on belly. Cyttosoma.

l.² Preorbital moderately deep; no enlarged scales. Pseudocyttus.

f.² Belly with scutes.

m.' Breast wide, imperfectly shielded.

n.' Branched ventral rays 9. Zen.

n.² Branched ventral rays 8. Cyttopsis.

m.² Breast with shields continuous with those on belly.

o.' Ventral fin large.

p.' Ventral fin without spine. Parazyttopsis.

p.² Ventral fin with spine. Stethopristes.

o.² Ventral fin short, with spine. Capromimus.

1895, p. 483 (Luzon, Cavite, Santa Cruz). 1/m Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled). 1/m Ishikawa and Mutsumura, Prelim. Cat. Fishes Mus. Tokyo, 1897, p. 53.

Sparus aries Bleeker, Nederland. Tijdschr. Dierk., vol. 4, 1873, p. 138 (China); Verhandel. Akad. Wetensch. Amsterdam (Emm. Pois. Japan), vol. 16, [illegible] 1874, p. 8 (reference [illegible]). 1/m Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, 1900, p. 355 (Tokyo), Annot. Zool. Japan, vol. 3, 1901, p. 69 (Yokohama, Nagasaki, Tano). 1/m Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, 1912, p. 581, fig. 7 (Wakanoura, Nagasaki, Tokyo, Hong Kong, Moreton Bay). 1/2n Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 415 (Tokyo, Shimizu, Kagoshima). 1/m Oshima, Jap. Journ. Zool. Trans. Abstracts, vol. 1, no. 5, March 31, 1927, p. 148 (Pescadores, Okinawa, Keelung).

E.[2] Body with large cone-like projections on back and belly.

Oreosoma.

Chrysophrys Chrysargyra Valenciennes, Hist. Nat. Poiss., vol. 6, 1830, p. 107 (on Chitchillee Russell, Fishes of Coromandel, vol. 1, 1803, p. 73, pl. 91, Vizagapatam). Chrysophrys aries Hckl. Fauna Japonica, Poiss., fts. 2–4, 1843, p. 67, pl. 3, fig. 3 (Nagasaki. 1/3 Richardson, Ichth. China Japan, 1846, p. 240 (Chinese Seas). 1/m Bleeker, Verhandel. Batavia. Genootsch. (Jap.), vol. 26, 1857, p. 87 (Nagasaki). 1/m Günther, Cat. Fishes British Mus., vol. 1, 1859, p. 487 (China). 1/m Martens, Preuss. Exped. Ost Asien, 1876, p. 350 (Yedo; Yokohama). 1/m Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, Math.-Naturw. Classe, vol. 48, pt. 1, 1884, p. 18 (Tokyo and Tango). — Day, Fishes of India, Supplement, 1888, p. 780; Fauna British India, Fishes, vol. 2, 1889, p. 46. 1/m Elera, Cat. Fauna Filipina, vol. 1,

Genus Zeus Linnaeus

Zeus Linnaeus, Syst. Nat., ed. 10, Pt. 1, p. 266, 1758. (Type Zeus faber Linnaeus, designated by Gill, Proc. Acad. Nat. Sci. Philadelphia, p. 126, 1862.)

We feel that the Acanthurus lineolatus Valenciennes, based on an example but 100mm. long is this species. It is very briefly noticed with the caudal points extended, the color brownish black with very fine bluish longitudinal lines and the pectoral greenish. Günther's figure is surely intended for our species, though the caudal is shown as more obtuse and not deeply enough emarginated.

Body ovate, greatly compressed. Head deeper than long, profile steep. Small teeth in jaws and on vomer, none on palatines. Preopercle unarmed. Gill rakers short. Branchiostegals 7. Series of spinous plates between ventrals and anal, also series of bony plates along soft dorsal and anal bases, feebly developed or none along spinous dorsal and anal - and each plate with pair of spines. Scales small, rudimentary. Dorsals separate, near together, spines high and strong, some filamentous. Anal spines 4. Ventral with spine and 6 or 7 rays.

Species few, of remarkable appearance - and all with round black

Body largely uniform chocolate brown, some examples with pale gray traces of small oblique gray lines on head and very fine longitudinal grayish lines on body. Vertical fins usually little deeper chocolate brown than body, and mostly with blackish spot at bases of few last dorsal and anal rays. Hind caudal edge usually very narrowly whitish. Pectoral brownish, ventrals dusky. Iris brown.

spot on middle of side.

Gray brown generally, variably more bluish gray in some examples, especially about head and costal region. Broad blackish brown band strongly contrasted, like all rest of similar dark color of back; band extends up above suprascapular region or along upper edge of back, gradually broadening until reaching front of caudal peduncle; a forward extension continued along median axis of tail from caudal spine till nearly abovepectoral base; with age this band slopes up to dark dorsal band with which it unites just behind suprascapular region; posteriorly dark area of back extends above and below as strongly contrasted border both along caudal peduncle and caudal fin, pale intervening cuneate area resulting yellowish buff. Iris dusky. Bases of dorsals and anals broadly grayish or light bluish with tinge of light brown, margins of fins broadly blackish. Pectoral grayish or blue gray over greater basal half or more, dusky above and hind margin broadly pale yellowish buff; young with uniform pale pectoral. Ventral pale, hind edge little brownish.

Mauritius to the East Indies, Philippines, Melanesia.

"In the aquarium at Plymouth I have noticed that the dory has a peculiar and interesting method of securing its prey. It does not overtake it by superior speed like the mackerel, or lie in wait for it like the angler, but stalks it and approaches it by stealth. It is able to do this in consequence of the extreme thinness of its body, - and the peculiar movement of its hinder dorsal and ventral fins. The dory places itself end on towards the fish it desires to devour, and in this position it is evident that it excites no alarm on the part of its prey. The appearance of the dory seen in this way

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Sparus sarba Forskål

Sparus sarba Forskål, descript. animal., 1775, pp. [S.C.] XI, 31. Djidda, Red Sea. 1/m Gmelin, Syst. Nat. Linn., vol. 1, 1789, p. 275 (Arabia). 1/m Walbaum, Artedi Piscium, vol. 3, 1792, p. 294 (on Forskål). 1/m Schneider, Syst. Ichth. Bloch, 1801, p. 280 (Red Sea). 1/m Lacépède, Hist. Nat. Poiss., vol. 4, 1802, p. 307 (Arabia). 1/m Jordan and Veale, Proc. Davenport Acad. Sci., vol. 10, 1905, p. 10 (Hong Kong). 1/m Roughley, Fishes of Australia, 1916, p. 137 (east, north, and west coast lines). → 1/m I Barnard, Ann. South African Mus., vol. 21, pt. 2, 1927, p. 687 (Algoa Bay, East London, Natal, Zululand coast, Delagoa Bay).

Chrysophrys sarba Valenciennes, Hist. Nat. Poiss., vol. 6, 1830, p. 102 (Mauritius, Coromandel). 1/m Günther, Cat. Fishes British Mus., vol. 1, 1859, p. 485 (Red Sea). 1/m Guichenot, Voy. Ile Réunion,

is a mere line in the water, to which no particular significance can be attached. I have not particularly noticed the effect of the ribbons of membrane, which project from the dorsal fin. But I have observed that the movements of the dory are very gradual, except in turning: it alters the position of its body by a turn of the tail or side fins, and then slowly swims forward by vibrating the second dorsal and ventral, a movement which causes very slight disturbance of the water. The whole appearance of the dory in these actions is suggestive of suppressed excitement, his eyes being fixed

pectoral dark. Golden or bronzy band between eyes. Fins grayish. Dorsal often with dark edge. Iris golden.
(Reaches 500 mm. (Barnard.)

South west Africa, South Africa, Natal,

on his prey. I do not recollect seeing him actually swallow another fish, but have no doubt that he gets near enough to a sprat for example, without alarming it, to seize it by the sudden elongation of his curious jaws." (Cunningham, 1896.)

largest, in young transverse oval or
oblong, with age kindermost 1 or 2
longitudinally oval and very large;
preorbital longer than deep, not reaching
down to mouth angle, lower edge straight
in young to somewhat concave with age.
Gill rakers 6 or 7 on lower branch of first
arch.

Scales 58 to 61 in lateral line to
caudal base, 6 above, 14 to 16 below,
6 or 7 rows on cheeks; preopercle limb
and whole interorbital scaleless.

D. XI, 11 or 12, third to fifth spine
longest; A. III, 10 or 11, second spine
rather but stouter than third.

Silvery, grayish above, whitish below.
Five to 7 narrow vertical black bars,
often disappearing with age. Often
more or less distinct longitudinal
dark lines. Edges of opercle and

Analysis of Species

a.' Black ocellus on side above lateral line; bony scutes along soft dorsal base 19, along soft anal base 9 to 11. Capensis.

a.² Black ocellus on side below lateral line;

b.' Bony scutes along soft dorsal base 7 to 10, along soft anal base 8 or 9. Faber.

b.² Bony scutes along soft dorsal base 6 or 7, along soft anal 6 or 7. japonicus.

Scales 46 to 48 in lateral line to caudal base and ½ or 3 more on latter; 6 or 7 scales above, 15 to 17 below, 10 to 15 predorsal forward opposite hind eye edge; 4 rows on cheek. Suprascapula denticulate, entire with age. Scales with 12 basal radiating striae, 60 to 75. apical denticles, minute, rather slender points, with 1 to 10 transverse series of basal elements; circuli very fine.

D. X, 10, I, Fourth spine ½ to 2 7/8 in total head length, fifth ray ½ to 2 1/5; A. III, 10, I, third spine 3 to 3 3/5, second ray 2 1/5 to 2 3/5; caudal 1 to 1 1/5, deeply lunate, lobes angular or broadly rounded, lower usually little shorter; least depth of caudal peduncle 2 3/4 to 3; pectoral 1 1/5 to 1 1/3; ventral 1 1/6 to 1 1/2.

Brown, below paler or whitish. Back with 5 to 8 transverse dark streaks,

Zeus capensis Valenciennes

Zeus capensis Valenciennes, Hist. Nat. Poiss., vol. 10, p. 23, 1835 (type locality, Cape of Good Hope). — Günther, Cat. Fish. Brit. Mus., vol. 2, p. 394, 1860 — Bleeker, Natuurk. Tijds. Nederl. Indie, vol. 21, p. 54, 1860. (no locality). — Gilchrist, Marine Investig. South Africa, vol. 4, p. 154, 1908 (Cape Point Lighthouse, N. E. by E., 6 3/4 miles; Walker Point, E. by S., 5 miles; Gericke Point, N. 57° E., 8 miles; Cape Infanta, N. E. by N., 19 miles; Vondeling Island, N. 1/4 W., 9 miles; 23 miles S. W. from Cape St. Blaize; Gericke Point, N. E. 3/4 E., 13 1/2 miles); Fisher. Marine Biol. Surv. South Africa, Rep. No. 2, Spec. Rep. No. 3, p. 72, 1922 (off South Africa, 92 to 104 fathoms).

origin. Iris yellowish. Inside gill opening reddish. An underlaid narrow yellowish line begins behind upper hind edge of gill opening and extends back to bases of uppermost caudal rays, - at first largely parallel with lateral line, though posteriorly crosses lateral line on caudal peduncle. Fins all pale brownish, dorsal edged with white border, evidently yellow in life. Anal also with narrow submarginal yellow line. Pectoral yellow line from axillary scale of ventral fin out along hind ray to its tip.

China, Formosa, Japan. Listed from the Philippines by Elera. Distinguished chiefly by its coloration, longitudinal yellow line on body extending from supracaudula cross the lateral line,

— Von Bonde, Fisher. Marine Biol. Surv. South Africa, Rep. No. 3, Spec. Rep. No. 1, p. 26, 1922 (1924) (off South Africa, in 33 to 97 fathoms).

— Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 373, pl. 16, fig. 3, June 1925 (St. Helena Bay, Saldanha Bay, Table Bay, Agulhas Bank, Natal, 20 to 100 fathoms).

Collection. Length 241 mm.

75486 U.S.N.M. Kawasaki. Albatross Collection. Length 146 to 25?. mm. 3 examples.

84240 U.S.N.M. Sumboanga. Dr. F. Baker. Length 207 to 210 mm. 2 examples.

27608, and 27609 A.N.S.P. Padang, Sumatra. A.C. Harrison and H.L. Miller. Length 63 to 229 mm.

Fresh in arrack - dull olivaceous above, below white washed with silvery. Side with 5 narrow vertical dusky bars, last little oblique forward to middle of anal. Vertical dusky bar across side of head, with deep brown blotch on iris above. Side with rather indistinct narrow dusky longitudinal bands following courses of scales. Dorsal, anal and caudal dusky, former with dark gray spots. Pectoral whitish. Ventral little dusky.

Depth 2 1/10; head 2 1/2 2 3/5. Snout 2 1/7 in. head from snout tip; eye 3 1/7, 1/3 in snout; maxillary reaches 4/5 to eye, expansion 1/2 in. eye, length 1/2 in. head from snout tip; internarial bar, frontal depth 3 1/7 in. head from snout tip.

Lateral line high, forward, back median midway in length of tail. Vent back of forward dorsal. Dorsal 11, ray 1 to 11 and each with single spine at base. Ventral 1, 5 to 1, 6, its origin

[illegible]

[illegible]

A516, A522. Bukan. September 13, 1907. Length 290 to 295 mm.

18679. Hinunangan Bay, Leyte. June 30, 1907. Length 127 mm.

7015. Port Van Fio Quinto. November 10, 1906. Length 580 mm.

4877. Visi Island Inlet. February 17, 1906. Length 270 mm.

7366. Tara Island. December 15, 1906. Length 203 mm.

6001, 6010, 6492. Zamboanga market. May 27-29, 1908. Length 255 to 310 mm.

56020 U.S.N.M. Zamboanga. ~~Dr. C. A. Kearns~~ Bureau of Fisheries (4046). Length 150 mm.

56021 U.S.N.M. Zamboanga. Dr. C. A. Kearns. Length 324 mm.

71288 U.S.N.M. Misaki, Japan. Albatross Collection (0693). Length 228 mm.

75485 U.S.N.M. Nagasaki. Albatross.

caudal 2 1/8, convex behind; least depth of caudal peduncle 6; pectoral 2 1/4, fin rays 14; ventral I, 5, fin 1 1/3, spine nearly 1/3 of fin.

Silvery. Iris silvery, pupil translucent. Rounded black spot, bordered with whitish on side of back above lateral line, about level with upper half of eye. Length to 600 mm. (Barnard.)

South Africa, Natal.

Constantly differs from Zeus faber in the position of its black ocellus, alway above the lateral line about the upper fourth of its body depth.

irregular, variable, often obsolete in preserved examples. Iris yellowish brown. dorsals and anals often clouded or spotted obscurely with darker. Caudal often clouded darker, sometimes each lobe with many as 7 oblique cross bands of darker. Pectoral pale or dull brownish, base deeper brown. Ventral brown, dusky to neutral dusky on membranes, especially terminally.

Mauritius, East Indies, Philippines, Indo China, China, Japan. A very variable species. Young specimens often with a dark blotch on the iris above, a dark interorbital line or band, also a broad dark band transversely on cheek below eye or caudal with 3 or 4 dark transverse bands.

Zeus faber Linnaeus

Zeus faber Linnaeus, Syst. Nat., ed. 10, pt. 1, p. 267, 1758 (type locality, "in Pelago"); ed. 12, pt. 1, p. 454, 1766. — Bonnaterre, Tabl. Ichth., p. 73, pl. 39, fig. 154, 1788 (Atlantic; Mediterranean). — Wallbaum, Artedi Pisc., vol. 3, p. 394, 1792 (copied). — Valenciennes, Règne Animal, Cuvier, Ed. Ill., Poiss., pl. 60, fig. 1, 1839. — Günther, Cat. Fish. Brit. Mus., vol. 2, p. 393, 1860 (type of Zeus australis). — Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 115, 1893 (reference).

of preorbital 3 4/5 in head and 9 or 10 rows of scales above lateral line for P. auratus. My materials are so variable they are indistinguishable structurally. I am, therefore, obliged to leave the species simply as provisional geographic expressions. P. major Indo-Chinese-Japanese and P. auratus Australian.

Waite, Rec. Canterbury Mus., vol. 1, no. 1, p. 25, April 25, 1907 (reference). — Roughley, Fishes of Australia, p. 168, pl. 58, 1916. — Waite, Rec. South Austral. Mus., vol. 2, no. 1, p. 74, fig. 113, April 23, 1921 (reference). — McCulloch, Fish New South Wales, ed. 2, p. 34, pl. 12, fig. 122a, 1927; Trans. Austral. Mus., vol. 5, pt. 1, p. 136, June 29, 1929 (reference).

the yellow lines marginally on dorsals, anal and ventral and by its caudal filament.

64756. D.5305. China Sea (21°54' N., 114°46' E.). October 24, 1908. Length 238 mm.

42444. Port Binanga, Luzon. January 8, 1908. Length 168 mm. Without trace of yellow on body or fins - and caudal filament broken terminally.

22577 U.S.N.M. Kuwa, Japan. Japanese Government. Length 255 mm.

44917 U.S.N.M. Japan. Japanese Government. Length 298 mm.

59741 U.S.N.M. Kochi, Dr. H. M. Smith. Length 220 mm.

71094 U.S.N.M. Shimizu. Albatross Collection. Length 72 to 103 mm. 4 examples.

71139 U.S.N.M. Tokyo. Albatross Collection. Length 290 mm.

Zeus australis Richardson

Zeus australis Richardson,
Ichth. Voy. Erebus and Terror,
p. 36, pl. 25, fig. 1, 1845; p. 138,
1848 (type locality, Port Jackson;
New South Wales; Western
Australia). — Waite, Mem. Austral.
Mus., vol. 4, pt. 1, p. 89, december 23,
1899 (off New South Wales).

— Castelnau, Proc. Zool. Acclimat. Soc.
Victoria, vol. 1, p. 108, 187 (Melbourne
market). — Macleay, Proc. Linn.
Soc. New South Wales, vol. 5, p. 550,
1881 (Port Jackson; Port Phillip).
— Jenison-Woods, Fish Fisher. New
South Wales, p. 61, pl. 21, 1883.

Depth I 3/4 to 2 I/8; head 3 I/4 to 3 4/5, width 2 to 2 1/4. Snout I 2/5 to I 3/4; eye 2 4/5 to 4 3/5, I 3/4 to 3 I/4 in snout, I to I I/3 in interorbital; teeth I2 to I4 in each jaw; maxillary 4 to 4 I/6 in head; interorbital 3 to 3 2/5, convex. Gill rakers 3 + 7, short, firm, broad points.

Scales very finely scabrous, compact, enlarged about preorbital and around and before caudal spine.

D. IX, I9 or 20, ninth spine I 3/4 to 2 I/5 in head, first ray I 4/5 to 2 I/IO; A. III, I9, third spine 2 I/5 to 2 I/4, first ray I 4/5 to 2 I/IO; caudal slightly emarginate behind, points little exserted, truncate in young, I I/5 to I I/4; least depth of caudal peduncle 2 7/8 to 3; pectoral I I/8; ventral I 7/8 to 2, spines robust; caudal spine 3 I/5 to 4.

Depth 1 5/6 to 1 9/10; head 2 1/3 to 2 2/5, width 4 to 4 1/3. Snout 2 1/8 in head from snout tip; orbit 4 1/3 to 4 3/4, 2 to 2 1/10 in snout, greatly exceeds interorbital; maxillary reaches 4/5 to orbit, expansion 1 3/5 to 1 3/5 in orbit, length 2 in head from snout tip; interorbital 6 1/5 to 6 4/5, low, nearly level. Gill rakers 5 + 9, short, low tubercles, 1/4 of gill filaments, which 1 2/5 in eye.

Scales round, very small, distinct, not imbricate; more distant on cheeks. Spiny bucklers 7 to 10 along soft dorsal base; 9 preanal, 8 or 9 along soft ~~dorsal~~ anal base. Lateral line complete, high at first, becomes median at middle of tail. Scales with 25 to 27 complete, concentric circuli.

4653. Tambum Siguurbul, Tongil Island. September 14, 1909. Length 38 mm.

19227. Tapiantana Island. September 13, 1909. Length 84 mm.

3883. Tataan Island, Tawi Tawi Group. February 21, 1908. Length 100 mm.

10445. Tilia, Lubang Island. July 14, 1908. Length 90 mm.

425. Togean Bay, Togian Island. November 19, 1907. Length 86 mm.

21731. Tulayan Island. September 15, 1909. Length 95 mm.

3634. Tulnakutan Island. September 21, 1909. Length 105 mm.

398. Uasadia Island. March 3, 1908. Length 41 mm.

D. X, 24 or 25, each spine with long terminal filament, third spine 1 1/5 to 1 3/5 in total head length, soft fin height 3 1/4 to 3 1/2; A. IV, 22 or 23, second spine 2 1/3 to 2 4/5, fin height 3 1/4 to 3 2/5; caudal 1 2/3 to 2, convex behind; least depth of caudal peduncle 5 to 5 1/4; pectoral 2 4/5 to 3; ventral 1 to 1 1/6, spine 1 7/8 in fin.

Uniform brownish, paler below. Round blackish blotch at middle of side, little larger than eye, with pale border. Iris and fins light brown, uniform.

Western Australia, New South Wales, Victoria, Tasmania, New Zealand. Also the Atlantic coasts of Europe and the Mediterranean.

20982 to 20984, 22211. Rapuraput Island. June 22, 1907. Length 76 to 90 mm.

3907. Reef, South Lagoon, Sumindao. February 26, 1908. Length 75 mm. [305.]

17488. Refugio Island, Pasacao, Luzon. March 9, 1909. Length 38 mm.

699 and 700. Tablayan, Mindoro. December 12, 1907. Length 72 to 76 mm.

19592 and 19593. Kinaluc Island. September 22, 1909. Length 97 to 101 mm.

17972. Kinaluc, Biabid Island. September 23, 1909. Length 75 mm.

21886. Kingaan Island. September 21, 1909. Length 85 mm.

22771. Kitaotao Reef. September 24, 1909. Length 87 mm.

14399. Talisai Island. November 7, 1909. Length 61 mm.

U. S. N. M., No. 47794. Port Jackson, New South Wales. Australian Museum. Length 208 & 295 mm. Two examples.

Depth I 9/10 to 2; head 3 I/3 to 3 3/4, width I 7/8 to I 4/5. Snout I I/3; eye 3 2/3 to 4, 2 3/4 to 3 3/5 in snout, I I/4 to I I/2 in interorbital; teeth 16 to 18 in each jaw; maxillary 4 to 4 I/2 in head; interorbital 2 7/8 to 3 I/5, convex. Gill rakers 7 + 14, short, feeble points.

Scales with minute circuli; apical denticles 11 to 14, with 2 or 3 series of transverse basal elements.

D. IX, 24 to 28, ninth spine I 4/5 to 2 in head, fourteenth ray I 4/5 to I 7/8; A. III, 26 or 27, third spine 2 I/5 to 2 I/4, first ray I 2/3 to I 4/5; caudal deeply lunate, with long, slender points, 2 I/6 to 2 2/5 in combined head and body; least depth of caudal peduncle 2 4/5 to 3 in head; pectoral I; ventral 2 7/8 to 3.

Zeus japonicus Valenciennes

Zeus japonicus Valenciennes, Hist. Nat. Poiss., vol. 10, p. 23, 1835 (type locality, Japan).. — [illegible] Schlegel, Fauna Japonica, Poiss., fts. 7–9, p. 123, 1845 (Japan). — Bleeker, Verh. Batavia. Genoot. (Japan), vol. 26, p. 105, 1857 (reference). — Günther, Cat. Fish. Brit. Mus., vol. 2, p. 394, 1860 (compiled); Rep. Voy. Challenger, vol. 4, pt. 6, p. 66, 1880 (Yokohama). — Lyström, Bih. Kon. Svensk. Vet. Akad. Handl., vol. 13, pt. 4, no. 4, p. 32, 1887 (Nagasaki). — Ishikawa and Matsmura, Prelim. Cat. Fish. Mus. Tokyo, p. 43, 1897. — Steindachner, Ann. Naturh. Hofmus. Wien, vol. 11, p. 241, 1896 (Japan).

— Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, p. 359, 1900 (Tokyo). — Jordan and Fowler, Proc. U. S. Nat. Mus., vol. 25, p. 517, 1902 (Tokyo, Misaki, Kobe, Hiroshima, Suruga, Nagasaki). — Jordan, Tanaka, Snyder, Journ. College Sci., vol. 33, art. 1, p. 207, 1913 (reference). — Jordan and Matsuura, Cat. Zool. Spec. Tokyo Mus., p. 139, 1920 (Tokyo). — Gilchrist, Fisher. Marine Biol. Surv. South Africa, Rep. No. 2, Special Rep. No. 3, p. 72, 1921 (1922) (off South Africa, 70 to 180 fathoms). — Von Bonde, Fisher. Mar. Biol. Surv. South Africa, Rep. No. 3, Special Rep. No. 1, p. 27, 1922 (1924) (off South Africa, 33 to 70 fathoms). — Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 374,

apical denticles, with 2 to 4 transverse series of basal elements; circuli very fine.

D. $\overline{\underline{X}}$, 9, $\underline{\underline{I}}$, third spine 2 1/5 to 2 1/2 in total head length, first ray 2 to 2 1/10; A. $\overline{\underline{III}}$, 7, $\underline{\underline{I}}$ or 8, $\underline{\underline{I}}$, third spine 2 7/8 to 3 1/8, first ray 2 1/5 to 2 2/5, last ray 2 to 2 1/10; least depth of caudal peduncle 2 7/8 to 3; pectoral 1 1/10 to 1 1/8; ventral 1 to 1 1/5; lower caudal lobe 1, upper with filament and 2 1/8 to 2 1/3 in combined head and body to caudal base.

Back brown, below much paler to whitish, entire body with silvery white sheen. Each row of scales on body longitudinally with slightly darker ill defined median band. Nebulous neutral dusky spot, less than pupil, at upper front part of opercle and another above pectoral

June 1925 (False Bay; Agulhas Banks; Natal; 30 & 180 fathoms); pt. 2, p. 1025, October 1927 (reference).
— Fowler, Proc. Acad. Nat. Sci. Philadelphia, vol. 77, p. 206, 1925 (Natal, 35 fathoms); vol. 80, p. 592, 1929 (Nagasaki).

Zeus faber japonicus Schlegel, Fauna Japonica, Poiss., pts. 7–9, pl. 66a, 1845.

of villiform teeth, followed each side laterally by single slightly enlarged row of simple conic teeth; interorbital 4 3/5 to 5 1/8, broadly depressed; preopercle edge entire; snout, interorbital, preorbital and preopercle flange vermiculate; opercle with small, flat, broad spine. Gill rakers 6 or 7 + 7 or 8, broad, flat, spinescent tubercles, 2/5 to 3/5 of gill filaments, which 2 1/4 in eye.

Scales 42 to 49 in lateral line to caudal base and 2 to 6 more on latter; 5 above, 10 below, 12 to 17 predorsal forward opposite eye center, 3 rows on cheek to preopercle ridge and preopercle flange naked. Suprascapula entire, vermiculate, like scales upward to eye above and bordering interorbital. Scales with 6 or 7 basal radiating striae, 35 to 120 short, weak, conic

Depth 1 1/2 to 1 7/8; head 2 2/5 to 2 2/3, width 3 1/2. Snout 2 1/10 to 2 1/4 in head from snout tip; orbit 3 1/3 to 4 2/5, 1 2/5 to 2 1/8 in snout, greatly exceeds interorbital; maxillary reaches opposite front orbital edge, expansion 1 3/5 to 1 3/4 in orbit, length 1 7/8 in head from snout tip; interorbital 4 1/2 to 6 1/8, low, slightly convex. Gill rakers 4 + 9, low, spinescent tubercles 1/3 gill filaments, which 1 7/8 in eye.

Scales small, simple, rounded, not imbricated; smaller and more wide set on cheek. Scales simple, with 28 to 30 complete circuli. Scutes of soft dorsal 6 or 7, of soft anal 6 or 7, postventral 7 to 9.

A548. Tulada Island. September 17, 1909. Length 313 mm.

A900. Limbe Strait, Celebes. November 10, 1909. Length 385 mm.

D. X, 23, spines all end in long filaments, longer in adult or reaching opposite caudal base; third spine 1 1/2 to 1 3/4 in total head length, soft fin height 3 to 3 4/5; A. IV, 22, second spine 2 3/4 to 3 1/10, fin height 2 4/5 to 4 1/5; caudal 1 2/3 to 1 4/5, convex behind; least depth of caudal peduncle 4 3/4 to 4 7/8; pectoral 2 1/2 to 3 1/4; ventral 1 to 1 1/3.

Brown, paler below. Iris brownish. Rounded blackish blotch, about size of eye, ringed paler at middle of side. Body of young especially with about 8 darker longitudinal dark bands, slightly convergent on tail behind and less distinct with age. Fins pale brownish. Ventral dark brown

8153. Alibijaban Island, Ragay Gulf. March 6, 1909. Length 215 mm.

8715. Batan and Rapurapu Islands. June 5, 1909. Length 226 mm.

9243. Camp Overton, Mindanao. August 6, 1909. Length 285 mm.

5366. Cebu market. April 5, 1908. Length 300 mm.

5387. Cebu market. April 6, 1908. Length 252 mm.

7540. Endeavor Strait. December 23, 1908. Length 217 mm.

7242. Naambe Bay, Jambalea Island. November 23, 1908. Length 233 mm.

784. Pandanan Island. March 24, 1909. Length 180 mm.

6550 and 6571. Port Barrocan. July 21, 1908. Length 333 to 345 mm.

8904. Rasa Island. June 17, 1909. Length 296 mm.

South Africa, Japan.

Proc. Acad. Nat. Sc. Philadelphia, 1927 (1930), p. 644 (Padang).

Lobotes microprion Bleeker, Natuurk. Tijdschr. Nederland. Indië, Dol. 2, 1851, p. 174. Batavia.

Depth 2 2/5 to 2 1/2; head 2 7/8 to 3 1/8, width 2 to 2 1/5. Snout 2 1/3 to 2 7/8 in head from snout tip; eye 2 3/4 to 3 1/4, 1 to 1 2/5 in snout, 1 to 1 1/5 in interorbital; maxillary reaches opposite eye in young or falls little short of front nostril with age, expansion 2 3/4 to 3 1/2 in eye, length 2 7/8 to 3 2/5 in head from snout tip; teeth in anterior villiform bands of 6 or 7 irregular rows in jaws, with outer row of enlarged strong conic teeth; interorbital 2 4/5 to 3 1/5, broad and slightly convex; preopercle edge entire, flange with vermiculate striae; preorbital with fine rugose striae. Gill rakers 4+5, short tubercles, 2 1/2 in gill filaments, which 3 in eye.

U. S. N. M., no. 50754. Tokyo, Japan. D. S. Jordan and J. O. Snyder. Length 305 mm.

U. S. N. M., no. 50755. Wakanoura. D. S. Jordan and J. O. Snyder. Length 85 to 171 mm. Three examples.

U. S. N. M., no. 50809.

Albatross Station 3713. U. S. F. Comm. Length 37 to 59 mm. Three examples.

U. S. N. M., no. 59680. Susaki, Japan. Dr. H. M. Smith. Length 102? mm. In poor preservation.

U. S. N. M., no. 82141. Miyazaki, Japan. Rev. Cyrus A. Clark. Length 90 mm.

Genus Zenopsis Gill

Zenopsis Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 126. (Type Zeus nebulosus Schlegel, monotypic.)

Parazenopsis Cligny, Ann. Sta. Aquic. Boulogne, vol. 2, pp. 82, 104, 1912. (Type Parazenopsis argenteus Cligny = Zeus conchifer Lowe, monotypic.)

Body greatly compressed, short and very deep in young, longer with age. Head moderate, well compressed. Snout long, compressed. Eye small, high, in posterior half of head. Mouth large superior. Maxillary not reaching eye. Lower jaw protruded. Teeth minute, in jaws and on

vomer, none on palatines. Gill rakers short. Bony bucklers along sides of breast, belly, and bases of dorsal and anal fins, each armed with strong spine. Lateral line complete. Dorsal with 10 strong spines, long and each with long terminal filament, which shorter with age. Anal with 3 short spines. Soft dorsal and anal similar, low, opposite, base of each long. Caudal short. Pectoral small, low. Ventral long, with spine and 7 rays.

Two species.

Analysis of Species

a. Dorsal rays 23, anal 22; 17 abdominal bucklers, of which 6 before ventrals. nebulosus.

a.² Dorsal rays 24 ~~to~~ 25, anal 24 to 26; 9 abdominal bucklers, of which 2 before ventrals. conchifer.

third spine longest.

Marine shore fishes of moderate size, valued as food. Distinguished from Dentex chiefly by their weaker canines, the scaleless preopercle flange and the absence of scales from the front and top of the head. Although Bleeker admitted 4 species from the Netherlands Indies they seem to me to fall into but 3.

Analysis of ~~the~~ species 6 1K 3m r.h

a.' Parallel ~~lines~~ wavy blue lines across snout.

b.' No broad yellowish preocular band.

c.' Dark band down over cheek from eye, at least in young; no white nuchal collar.

d.' Body with 5 to 8 transverse darker streaks, variable & obsolete. griseus. (only 3 rows)

d.² Body without transverse dark bands, general color uniform greenish. microdon.

c.² No dark vertical band below eye across cheek;

Zenopsis nebulosus (Schlegel)

Zeus nebulosus Schlegel, Fauna Japonica, Pois., pls. 7–9, p. 123, pl. 66, 1845 (type locality, Japan [= Nagasaki]). — Günther, Cat. Fish. Brit. Mus., vol. 2, p. 394, 1860 (Japan). — Steindachner and Döderlein, Denksc. Akad. Wiss. Wien, math.-naturw. Kl., vol. 49, pt. 1, p. 18, 188[illegible] (Tokyo). — Lyström, Bih. Svensk. Vet. Akad. Handl., Stockholm, vol. 13, pt. 4, no. 4, p. 32, 1887 (Nagasaki). — Ishikawa and Matsmura, Prelim. Cat. Mus. Tokyo, Fishes, p. 43, 1897 (reference). — Jordan and Snyder, Proc. U. S. Nat. Mus., vol. , p. 359, 1900 (Tokyo). — Jordan and Fowler, Proc. U. S. Nat. Mus., vol. 25, p. 515, 1902 (Tokyo; Misaki).

Depth 1 $\frac{2}{5}$; head 2 $\frac{1}{2}$. Snout short; eye 3 $\frac{2}{3}$ to 4 in head, 1 $\frac{1}{2}$ to 1 $\frac{3}{3}$ in snout; maxillary not reaching eye, expansion $\frac{3}{5}$ to $\frac{2}{3}$ in eye; interorbital 1 $\frac{1}{2}$ in eye; 2 ridges on top of head between eyes. Gill rakers 5+8, short, rounded stumps.

Scales small, cycloid, 110 in lateral line; 15 above, 80 below. Soft dorsal base with 7 bony bucklers, 6 along anal base. Abdominal bucklers 17, of which 6 before ventrals and 8 behind. Lateral line greatly arched in front.

D. $\frac{X}{\equiv}$ 23, spines with long terminal thread like filaments, soft fin gradually higher posteriorly; A. $\frac{IV}{\equiv}$ 22, second spine 3 in head; caudal short,

(Tokio, misaki, hayasaki). 1/m Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, 1912, p. 568, fig. 7 (Wakanoura, hayasaki, misaki). 1/m Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong).

Dentex xanthopterus Bleeker, Natuur. Geneesk. Arch. Nederl. Indië, vol. 2, 1845, p. 542. Batavia. (name only).

Dentex lethrinoides Bleeker, Natuurk. Tijdschr. Nederl. Indië, vol. 1, 1850, p. 102. Batavia.

Gymnocranius lethrinoides Bleeker, Atlas Ichth. Ind. Neêrland., vol. 8, 1876-77, p. 96, pl. (54) 332, fig. 1, pl. (56) 334, fig. 3 (Java; Sumatra). 1/m Evermann and Seale, Bull. Bur. Fisheries, vol. 26, 1906 (1907), p. 81 (Bulan). 1/m Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 243 (Zamboanga). 1/m Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 36 (Zamboanga). 1/m Fowler, Journ. Wash. Acad. Sci. Philadelphia, vol. 2, no. 12, 1904, p. 527 (Padang). 1/m Fowler,

hind edge convex; caudal peduncle very narrow, compressed; pectoral rays 12, about equals snout; ventral 1 2/3 to 1 3/4 in fish without caudal, rays I, 6.

Silvery brown, - dark on back and upper part of head, inclining silver white below. On body laterally some large brownish spots or blotches, most distinct in young. On side behind gill opening blackish ocellated spot? Spinous dorsal filaments brownish black, and dark brown blotches on membranes above. Caudal with outer dusky blotch. Ventrals dark brown, darker terminally and outer portion blackish, with 5 blackish cross

† Károli, Termesz. Füzetek, Budapest, vol. 3, 1881, p. 154 (Kagosaki). 1/87 Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-naturw. Klasse, vol. 48, pt. 1, 1884, p. 16 (Tokyo). † Franz, Abhandl. K. Bayer. Akad. Wiss., math.-physik. Klasse, vol. 4, suppl. band 1, 1910, p. 47, pl. 5, fig. 24 (Aburatsubo; Yagoshima). † Tirant, Service Océanogr. Pêch. Indo-Chine, 6e note, 1929, p. 168 (Phu Yen).

Synagris griseus Bleeker, Nederlandsch. Tijdschr. Dierk., vol. 4, 1868-74, p. 117 (China).

Gymnocranius griseus Bleeker, Verhandel. Kon. Akad. Wetensch. Amsterdam, no. 3, vol. 13, 1873, p. 43 (Java, Japan); Atlas Ichth. Ind. Nederland, vol. 8, 1876-77, p. 96, pl. (74) 352, fig. 4 (Java, Japan). † Jordan and Snyder, Annotat. Zool. Japon., vol. 1, 1901, p. 77 (Yokohama; Nagasaki). 1/2 Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 415

bands. Length 120 mm.
(Jordan and Fowler.)

Japan. I have only studied two examples many years ago contained in Stanford University.

broad white nuchal collar, branches to eye and preopercle edge. bitorquatus.

b.[2] A broad yellowish horizontal preocular band. frenatus.

a.[2] Gymnocranius. Waved blue lines across snout, cheek and opercle; dorsals and anals rosy, with darker edges. robinsoni.

Cave 12

Subgenus Paradentex Bleeker Cave 13

No waved blue lines across snout.

Cave 14 Gymnocranius griseus (Vchlegel)

Dentex griseus Vchlegel, Fauna Japonica, Poiss., pts. 2-4, 1843, p. 72, pl. 36. South west coasts of Japan. 1/24 Bleeker, Verhandel. Batavia. Genootsch. (Het. Ichth. Japan), vol. 25, 1853, p. 13; No. 4, vol. 26, 1854-57, p. 88 (Nagasaki, Java, Sumatra); Act. Soc. Ind. Néerland., No. 3, vol. 3, 1857-58, p. 5 (Japan). 1/24 Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 372 (Japan). 1/24 Peters, Monatsber. Akad. Wiss. Berlin, 1876, p. 437 (Mauritius).

Zenopsis conchifer (Lowe)

Zeus conchifer Lowe, Proc. Zool. Soc. London, 1850, p. 247 (type locality, Madeira); Ann. Mag. Nat. Hist., ser. 2, vol. 10, p. 49, 1852 (Madeira). — Günther, Cat. Fish. Brit. Mus., vol. 2, p. 395, 1860 (type).

Zenopsis conchifer Goode and Bean, Oceanic Ichth., p. 225, 1895 (reference). — Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 374, June 1925 (Algoa Bay, Natal, 50—to 154 fathoms). — Ribeiro, Arch. Mus. Nac. Rio de Janeiro, vol. 17, Zeidae, p. 4, pl. (upper figure) 1915 (Raza Guaratiba). — Devincenzi, Anal. Mus. Hist. Nat. Montevideo, ser. 2, vol. 2, 1924, p. 220 (Montevideo).

Zenopsis concifer Gilchrist, Fisher. Marine Biol. Surv. South Africa, Rep. No. 2, Spec. Rep. No. 3, 1921 (1922), p. 72 (off South Africa, 100 to 154 fathoms) (error).

Zeus ocellatus Storer, Proc. Boston Soc. Nat. Hist., vol. 6, p. 386, 1858 (type locality, Provincetown, Massachusetts).

Zenopsis ocellatus Jordan and Gilbert, Bull. U. S. Nat. Mus., No. 16, p. 457, 1882 (type). — Goode and Bean, Oceanic Ichth., p. 224, fig., 1895 (type). — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 2, p. 1660, 1898 (copied); pt. 4, pl. 246, fig. 618, 1900 (type). — Fish, Copeia, 1931, No. 4, December 28, p. 152 (south part of Capt Henry, Virginia, 20 to 50 fathoms).

Zenopsis ocellata Jordan, Evermann, Clark, Rep. U. S. Comm. Fisher., pt. 2, 1928 (1930), p. 232 (reference). fig. (outline of tail)

Zenopsis figueirai Berg, Anal. Mus. Nac. Buenos Aires, vol. 4, p. 43, 1895 (type locality, Montevideo).

Parazenopsis argenteus Cluny, Ann. Sta. Aquac. Boulogne, vol. 2, pp. 82, 104, 1912 (type locality, off Morocco).

Paraxenopsis argenteus Ldny,

depth 1 $\frac{3}{4}$ to 2; head 2 $\frac{2}{5}$ to 3, width 3 to 3 $\frac{4}{5}$. Snout 2 $\frac{1}{4}$ in head from snout tip; eye 5 $\frac{1}{2}$ to 5 $\frac{4}{5}$, 2 $\frac{2}{3}$ to 2 $\frac{3}{4}$ in snout, 1 to 1 $\frac{1}{5}$ in interorbital; orbit 4 $\frac{1}{3}$ to 4 $\frac{3}{4}$ in head from snout tip; maxillary subvertical, extends $\frac{3}{4}$ to $\frac{4}{5}$ to ~~eye~~ orbit, expansion 1 $\frac{1}{5}$ to 1 $\frac{1}{3}$ in orbit; interorbital 5 in head from snout tip, low, very slightly convex. Gill rakers 3 + 7 to 10 short knobs, $\frac{1}{2}$ of gill filaments.

Lateral line greatly arched on trunk, falls median on tail posteriorly and along caudal peduncle to caudal base; straight section equals curved section in small example, about 1 $\frac{1}{8}$ in curved section in adult.

of scales longitudinally on back and upper sides with median dark band.

Abundant in Australian waters and valued as a food fish. The black spot or dot at the origin of the pectoral fin always distinct at all ages.

5/893 U.S.N.M. Port Jackson.
D. G. Stead. Length 62 to 215? mm.
8 examples.

49328 to 49330 A.N.S.P. Melbourne.
Mrs. Agnes F. Kenyon. Length 216 to 232 mm.

dorsal bucklers 7 or 8, of which 3 or 4 along base of spinous fin; anal bucklers 4 or 5; 2 bucklers on chest and 7 pairs between ventral and anal.

Chrysophrys australis Castelnau, Proc. Zool. Accimatiz. Soc. Victoria, vol. 1, 1873, p. 130 (West Australia).

Sparus australis Schmeltz, Cat. Mus. Godeffroy, No. 4, 1869, p. 14 (Rockhampton and Port Mackay). 1/3 m Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 218 (on Günther).

Pagrus australis Waite, Rec. Fish. Rep. Thetis, 1898, p. 26 (Port Stephens, New South Wales).

Pagrus microptenus Richardson, Travels New Zealand, Dieffenbach, vol. 2, 1843, p. 209. New Zealand.

Pagrus ciliaris Richardson, op. cit., vol. 2, 1843, p. 209. New Zealand.

m Roughley, Fish. of Australia, 1916, p. 134, pl. 43 (Australia, Tasmania, New Guinea).

D. IX, 26, first spine 1 2/5 to 1 1/2 in total head length, soft fin height 3; A. III, 24 or 25, first spine 4 1/5 to 5 1/2, fin height 3 1/5 to 4 1/2; caudal 1 3/5 to 2, slightly emarginate behind; least depth of caudal peduncle 7 4/5 to 8 1/4; pectoral 2 1/5 to 2 1/4, rays I, 12 or I, 13; ventral I, 5, fin length 1 1/3 to 1 1/2 in total head length.

Gray brown in alcohol, paler below. When fresh leaden or pewter gray above, light gray below. Below level of eye, though just above level of straight section of lateral line, large ill defined neutral black blotch, with slightly pale or gray border, about opposite

denticles, with a series of smaller ones transversely and basally; circuli very fine.

D. XI or XII, 10, I or II, I, fourth spine 1 7/8 to 2 in head, first ray 2 1/4 to 2 1/2; A. III, 8, I, second spine 1 3/4 to 2, first ray 2 to 2 1/10; least depth of caudal peduncle 2 3/4 to 2 4/5; ventral 1 1/3 to 1 2/5; caudal 3 in combined head and body to caudal base, well forked, lobes sharp pointed; pectoral 2 1/2 to 2 3/5.

Brown above, paler to whitish below. Iris gray or slate. Fins all pale brownish, dusky on membranes of dorsals terminally, front anal membranes terminally and broad hind caudal edges, also conspicuous small black spot at pectoral origin. Young show about 8 obsolete transverse dark bands on side of back and each row

~~[illegible]~~ or slightly behind end of depressed pectoral in vertical. Iris grayish. Fins largely light gray. Spinous dorsal and ventral neutral black, though latter paler basally and with 4 or 5 obscure transverse dark neutral bars.

Atlantic Ocean, widely distributed in the Gulf Stream from off Virginia, New Jersey and Massachusetts to Brazil, Uruguay, Madeira, Morocco, South Africa and Natal.

Depth 2 1/8 to 2 1/3; head 2 4/5 to 3, width 2 to 2 1/5. Snout 2 1/2 to 3 in head; eye 2 7/8 to 4 1/3, greater than snout in young to 1 7/8 with age, greater than interorbital to 1 to 1 4/3 with age; maxillary reaches 1/8 in eye, expansion 1 2/5 to 2 3/4 in eye, length 2 2/3 to 3 in head; 6 front canine canines in each jaw, 5 rows of upper posterior molars each side and 4 below; interorbital 3 to 4, convex. Gill rakers 7+9, lanceolate, 1/2 of gill filaments, which 1 1/3 in eye.

Scales 43 to 46 in lateral line to caudal base and 10 more on latter; 5 above, 12 or 13 below, 19 to 22 predorsal forward opposite eye center, 5 rows on cheek to preopercle ridge. Scales with 13 to 16 basal radiating striae; 17 to 20 weak short apical

A. N. S. P., No. 60170. Fifty miles S. E. of Five Fathom Bank Light Ship, southeast of New Jersey. On 70 fathoms. February 5, 1934. Raymond Alter. Steam Tr. Brown. Length 437 Tons.

A. N. S. P., Nos. 60240 and 60241. Fifty miles S. E. of Five Fathom Bank Lightship. On 70 fathoms. March 16, 1934. Raymond Alter. Steam Tr. Brown. Length 275 to 378 Tons.

vol. 80, pt. 1, 1879, p. 357 (Queensland, Hobson Bay, Cleveland Bay). 1/m Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 33 (Mary River, Tiaro, Queensland). 1/m de Vis, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 457 (Api, New Hebrides). 1/m Ogilby, Handbook of Sydney, 1898, p. 129. 1/m Stead, Fishes of Australia, 1906, p. 125, fig. 47 (New South Wales, Queensland, West and North Australia, Tasmania, Victoria). 1/m Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 44 (Melbourne); 1929 (1930), p. 644 (Melbourne material).

Genus Cyttus Günther

Cyttus Günther, Cat. Fish. Brit. Mus., vol. 2, p. 396, 1860. (Type Caprox australis Richardson, designated by Goode and Bean, Oceanic Ichth., p. 225, 1895.)

Body rhomboid, compressed, deep. Head moderate, deep, compressed. Snout moderate, narrow. Eye high, in posterior half of head. Mouth greatly protractile, lower jaw protruded. Minute teeth in jaws and on vomer, none on palatines. Cheeks oblique, slopes forward, deep. Branchiostegals 8. Scales very small. Lateral line axial, little arched at first. Soft dorsal and anal bases without bony plates. Spinous dorsal with long spines, graduated shorted behind. Soft dorsal and anal low, alike. Caudal little rounded behind. Pectoral very small, rays 11.

Ventral with spine and 6 rays, origin slightly before pectoral origin, fin elongate, received in sheath on abdomen and cover vent.

Australia and New Zealand.

Analysis of Species

a.' Pectoral $3\frac{1}{5}$ in head; no small rough scales from dorsal or anal bases forward on head. australis.

a.² Pectoral ½ in head; series of rough small scales on dark line along dorsal fin base forward to interorbital, also along anal fin base and forward to isthmus.

novae-zealandiae.

contracted with body.

u.[1] depth 2 2/5 to 2 1/2; 5 scales above lateral line. mahsena.

u.[2] depth 2 3/5 to 2 4/5; 6 scales above lateral line. leutjanus.

m.[2] Five oblique green bands on cheek. olivaceus.

m.[2] Black streak before eye; pectoral 1 3/4 in head. microdon.

l.[2] Snout short. borbonicus.

k.[2] Black spot on temple. caeruleus.

j.[2] Second dorsal spine longest. argentens.

- Can 13 name only

Cyttus australis (Richardson)

Caprox australis Richardson, Ann. Mag. Nat. Hist., vol. 11, p. 470, March 1843 (type locality, Port Arthur, Tasmania); Ichth. Erebus and Terror, p. 137, pl. 59, figs. 1–5, 1845 (1844–48) (Sydney; Tasmania; Western Australia).
(Trans. Zool. Soc. London, vol. 3, p. 72, 1849 ( );

Cyttus australis Gunther, Cat. Fish. Brit. Mus., vol. 2, p. 396, 1860 (types). — Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 551, 1881 (compiled). — Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 115, 1893 (reference). — Waite, Rec. Canterbury Mus., vol. 1, no. 1, p. 25, April 25, 1907 (reference). — Stead, Edib. Fish. New South Wales, p. 102, pl. 68, 1908. — Waite, Rec. South Austral. Mus., vol. 2, no. 1, p. 75, fig. 114; April 23, 1921. — Mc Culloch, Fishes New South Wales, ed. 2, p. 34, pl. 12, 124a, 1927; Trans. Austral. Mus., vol. 5, pt. 1, p. 135, June 29, 1929 (reference).

Depth 1 4/5; head 2 3/4, width 3 1/5. Snout 2 1/5 in head from snout tip; eye 3 1/8, 1 1/2 in snout, subequal with interorbital; maxillary reaches about 2/3 in snout, length 1 9/10 in head from snout tip; interorbital 3 1/5, low, broadly convex.

Scales very small. Cheek finely scaled.

D. IX, 28, second spine 2 1/4 in fish without caudal, soft fin height 3 in total head; A. II, 30, soft fin height 3; caudal 1 2/3, convex behind; pectoral 3 1/5, rays 11; ventral rays I, 6, fin 1 2/3 in total head length.

Membrane of first dorsal and ventral blackish. Length 127 mm.

(Richardson.)

extending forward opposite front
eye edge.

D. X, 10 or 11, fourth and fifth spines
longest, equal postorbital part of
head; A. 9 or 10.

Silvery, grayish above. Waved blue
lines across snout, cheek and opercle.
Dorsal and anal rosy or yellowish,
with deeper colored edge. Caudal
and pectoral pinkish. Ventrals yellow.
Length to 400 mm. (Barnard.)

Red Sea, Madagascar, Natal, Ceylon.

New South Wales, Victoria,
Tasmania, South Australia, New
Zealand. Western Australia,

Fauna British India, Fishes, vol. 1, 1889, p. 525. 1/2 Gilchrist and Thompson, Ann. South African Mus., vol. 13, 1914, p. 68 (Natal). Ann. Durban Mus., vol. 1, pt. 4, 1917, pp. 356, 357 (references). — Malpas, Ceylon Administrat. Rep., 1921, pp. E6, E7.

Gymnocranius rivulatus Klunzinger, Verhandel. zool. bot. Gesells. Wien, vol. 20, 1870, p. 765 (Kosseir, Red Sea); Fische Roth. Meer, 1884, p. 36.

Depth 2 1/4 to 2 2/3; head 3. Eye 2 to 3 1/2 in head, slightly less than snout, 1 to 1 1/4 in interorbital, about equals preorbital depth; canines 4 to 6, rather variable in size and are lateral teeth; nostrils close together, hind one not elongate, scarcely larger than front one.

Scales 45 to 47 in lateral line, 6 or 7 above, 17 to 19 below; 4 or 5 rows on cheeks to preopercle ridge, flange scaleless; predorsal scales not —

Cyttus novae-zealandiae (Arthur)

Zeus novae-zealandiae Arthur, Trans. New Zeal. Inst., vol. 17, p. 163, pl. 14, fig. 3, 1885 (type locality, off Otago Heads, New Zealand, 25 fathoms).

Cyttus novae-zealandiae Waite, Rec. Canterbury Mus., vol. 1, No. 1, p. 25, April 25, 1907 (reference). — Mc Culloch, Mem. Austral. Mus., vol. 3, pt. 1, p. 135, June 29, 1929 (reference).

Depth 1 4/5; head 2 9/10. Snout 2 1/3 in head from snout tip; eye 3, 1 1/5 in snout; maxillary subvertical, extends 2/3 to eye, expansion 2 in eye, length 2 1/5 in head from snout tip; teeth small, villiform, in jaws, none on vomer, interorbital low.

Scales 114 in lateral line, which arched high anteriorly, becomes median on side of caudal peduncle. Row of small rough scales along dark line at dorsal base and prolonged to interorbital, also along anal base and prolonged to keel of isthmus, hardly bucklers or bony plates. Cheeks with small smooth scales.

D. I, VI, 31, (broken spines evidently higher than soft fin) soft

ones in inner row very large; preorbital longer than deep, lower edge slightly concave. Gill rakers 8 on upper on lower branch of first arch.

Scales 59 to 61 in lateral line, 6 or 7 above, 14 to 16 below, 7 rows on cheeks, preopercle limb and whole of interorbital scaleless.

D. XI, 11, third to fifth spines longest; A. III, 10.

Silvery, sometimes with bluish tinge above. Fins whitish or grayish. Young with 6 or 7 narrow longitudinal brownish stripes which disappear with age. Reaches 1000 mm.

(Barnard.)

South Africa, Natal.

fin height $3\frac{4}{5}$ in total head length; D. II, 30, soft fin height 4; caudal $1\frac{4}{5}$, truncate; least depth of caudal peduncle $4\frac{2}{3}$; pectoral 2, rays I, 10; ventral rays I, 6, fin $3\frac{1}{5}$ in total head length.

Silvery. Iris silvery white, pupil black. First dorsal black, second dorsal, pectoral and anal pinks. Caudal crimson, with white submargin, edged blacks. Ventral white, with black tips. Length 198 mm.

(Arthur.)

New Zealand.

Cover 179

Sparus durbanensis (Castelnau)

Pargus durbanensis Castelnau, Mém. Poiss. Afrique Australe, 1861, p. 18. Durban, Natal.

1/2 Gilchrist and Thompson, Ann. South African Mus., vol. 6, 1908-10, p. 230 (Breakwater at Durban); Ann. Durban Mus., vol. 1, pt. 4, 1917, p. 359.

Pagrus durbanensis Barnard, Ann. South African Mus., vol. 21, pt. 2, 1927, p. 688, pl. 28, fig. 4 (False Bay, Agulhas Banks, Algoa Bay, Natal).

Depth 2 4/5 to 3; head 3 1/5 to 3 1/2, profile sloping nearly evenly convex. Eye 6 to 6 1/2 in head, 2 to 2 1/2 in snout, 2 3/4 to 3 in interorbital, 1 1/3 to 1 1/2 in preorbital depth; 4 front incisors in each jaw, middle pair much larger than others, curved, upper pair overlapping lower pair when mouth closed; upper molars in 4 or 5 series, 2 or 3 lower, hindermost

Genus Rhombocyttus Gill

Rhombocyttus Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 123, 1893. (Type Cyttus traversi Hutton, orthotypic.)

Body very deeply rhomboid, high as long. Head deep, large. Snout long, oblique. Eye high, in posterior part of head. Mouth superiorly terminal, lower jaw protruding. Maxillary not reaching below eye. Minute teeth in low jaw and only in center of upper jaw, none on palate. Preopercle entire. Scales very minute, each prolonged backwards into small tooth. Lateral line complete, unarmed. Dorsal with spines long and filiform, longest little less than body depth.

Soft dorsal highest medially. Anal with 2 short detached spines, soft fin like soft dorsal. Caudal moderate. Pectoral short, base level with front of mouth. Ventral produced into long filaments nearly equal to body depth.

One species in New Zealand. Unique in the family this genus suggests superficially various carangids like Blepharis and Scyris in its high angulated rhomboid body and long filiform dorsal and ventral rays.

Rhombocyttus traversi (Hutton)

Cyttus traversi Hutton, Cat. Fish. New Zealand, p. 19, 1872 (type locality, Saltwater Creek, Canterbury); Trans. New Zealand Inst., vol. 5, p. 261, pl. 9, fig. 2, ~~1873~~ May 1873.

Rhombocyttus traversi Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 115 (123), 1893 (reference). — Waite, Rec. Canterbury Mus., vol. 1, no. 1, p. 26, April 25, 1907 (reference).

Depth 1; head 2 1/2. Snout 2 in head from snout tip; eye 2 1/2, 1 1/2 in snout; maxillary reaches 3/4 in snout; expansion 1 1/2 in eye, length 2 1/5 in head from snout tip; interorbital low forward, high posteriorly; preopercle edge very broad & true angle; supra margin of white sharply denticulated, short tentacle at middle of forehead.

Under very minute. Lateral line arched high, marks concurrent with dorsal fifths, becomes median only on caudal peduncle. Abdomen from throat to anal fin. Serrated.

D. A. 31, spines greatly extended as filaments of which fourth 1 1/8 in fish without caudal,

Cur 129 Sparus australis (Günther)

Chrysophrys australis Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 494. Port Essington; Port Jackson; Australia; Harvey River in fresh water, Australia. — Steindachner, Sitz. Ber. Akad. Wiss. Wien, Math.-Naturh. Classe, vol. 53, pt. 1, 1866, p. 434 (Port Jackson, Hobson's Bay and Salwater River). — Canestrini, Arch. Zool. Anat. Fisiol. Genova, series 2, vol. 1, 1869, p. 151 (Australia). — Castelnau, London Internat. Exhib. Cat., 1872, p. 133 (Victoria); Proc. Zool. Acclimatiz. Soc. Victoria, vol. 1, 1872, p. 71 (Melbourne market); Record London Internat. Exhib., 1873, pt. 7, No. 5, p. 10 (Victoria); Proc. Linn. Soc. New South Wales, vol. 3, 1878, p. (350) 373 (Port Jackson). — Klunzinger, Sitz. Ber. Akad. Wiss. Wien, Math.-Naturwiss. Classe,

soft fin height 2 1/4 in total head length; D. II, 37, soft fin height 2 1/5; caudal 1 4/5, convex behind; least depth of caudal peduncle 5; pectoral 2 7/8; ventral rays I, 6, rays greatly extended as long filaments, of which second ray 1 1/3 in fish to caudal base.

Silvery, reddish brown on back and tail, spots of same on sides. Fins yellowish. Pectoral rays spotted with black and 2 marks of same color on caudal. Length 75 mm. (Hutton.)

New Zealand.

59702 U.S.N.M. New South Wales.
H. G. Stead. Length 113 to 222 mm.
6 examples.

71272 U.S.N.M. Shimizu. Jordan
and Snyder. Length 150 mm. Ex
Uparus parbu.

75430 U.S.N.M. Wakanoura.
Jordan and Snyder. Length 122 to 300
mm. 3 examples.

75431 U.S.N.M. Tokyo. Jordan
and Snyder. Length 183 mm.

75432 U.S.N.M. Misaki Jordan
and Snyder. Length 83 mm.

10 mm. Ex

Genus Zenion Jordan and Evermann

Zenion Jordan and Evermann, Rep. U. S. Fish Comm., pt. 21, p. 418, 1895 (1896).

(Type, Cyttus hololepis Goode and Bean, monotypic.)

Body compressed, elevated, deep. Head large. Mouth protractile. Teeth very minute in jaws, on vomer, none on palatines. Branchiostegals 8. Scales very small. Bony plates along bases of dorsal and anal fins. Dorsal fins contiguous, first with 6 or 7 low spines. Short spine before anal. Ventral with spine and 6 soft rays, not depressible in groove.

Order Zeoidei.

Mouth very protractile. No supramaxillary. Anterior trunk muscles not for only just reaching posterior ends of frontals, which formed of ridged, tuberculated or pitted lateral portions bordering median depression for reception of long posterior extensions of premaxillaries. Occipital crest thin. Suspensorium inclined obliquely forwards and metapterygoid reduced. Vertebrae 31 to 46, first firmly attached to cranium. Caudal with 13 principal rays, of which 11 branched. Each ventral fin with spine and 5 to 9 branched rays.

Two families.

Analysis of Species

a.' Dorsal origin over ventrals. Lololepis.

a.² Dorsal origin before ventrals. Leptolepis.

Cat. 29 Gymnocranius bitorquatus Cockerell

Gymnocranius bitorquatus (Ogilby)
Cockerell, mem. Queensland mus., vol. 5,
July 10, 1916, p. 56. Moreton Bay, Queensland.
(Scales only.)

Gymnocranius audleyi Ogilby, mem.
Queensland mus., vol. 5, July 10, 1916, p.
170, pl. 22. Snapper Banks, off Moreton
Bay, Queensland.

Depth 2 1/5 to 2 1/3; head 2 4/5 to 3, width
2 1/6 to 2 1/5. Snout 1 9/10 to 2 1/10 in head; eye
3 1/2, 1 1/2 to 1 3/4 in snout, little over 1 in
interorbital; jaws equal; maxillary reaches
4/5 in snout, length 2 4/5 to 3 in head;
2 pairs of small front canines in each jaw;
outer lower largest, lateral teeth little
smaller than canines and become gradually
blunter posteriorly; interorbital 3 1/5 to
3 1/3, elevated and bluntly cultriform;

Zenion hololepis (Goode and Bean)

Cyttus hololepis Goode and Bean, Oceanic Ichthyology, p. 225, pl. 65, figs. 233, a-b, 1895 (type locality, lat. 20°19'N., long. 87°03'30", in 220 fathoms, off Yucatan; lat. 27°22'N., long. 78°07'30", in 338 fathoms, Little Bahama Bank). — Gilchrist and Von Bonde, Fisher. Marine Biol. Surv., Rep. No. 3, Special Rep. No. 7, p. 17, 1922 (1924) (off South Africa, 240 fathoms).

Zenion hololepis Jordan and Evermann, Rep. U. S. Fish Comm., pt. 21, p. 418, 1895 (1896) (reference); Bull. U. S. Nat. Mus., No. 47, pt. 1, p. 1661, 1896 (compiled). — Jordan, Evermann, Clarke, Rep. U. S. Comm. Fisher., 1928 (1930), pt. 2, p. 232 (reference). — Barnard, Ann. South Afric. Mus., vol. 21, p. 379, June 1925 (off Delagoa Bay, 240 fathoms).

depth 2 1/8 to 2 1/4; head 2 1/5 to 2 1/3, width 1 4/5 to 2. Snout 3 to 5 in head from snout tip; eye 1 3/3 to 2 1/6, greatly exceeds snout or interorbital; maxillary vertical, reaches nearly opposite front orbit edge, expansion 3 in orbit, length 2 1/4 to 2 1/3 in head from snout tip; teeth not evident in jaws or on palate; interorbital 2 to 2 7/8, low, level. Gill rakers 2 or 3 + 13, lanceolate, 4 1/2 in orbit; gill filaments 4/5 gill rakers.

Scales 44 to 56 counted along and close above lateral line to caudal base and 4 more on latter; ~~all counted along and close above~~ tubular scales 37 in lateral line to caudal base and 3 more on latter;

Holacanthus flavissimus Cuvier.

Holacanthus flavissimus Cuvier, Hist. Nat. Poiss., vol. 7, 1831, p. 197. Ulea, Carolines. — Günther, Journ. Mus. Godeffroy, band 2–3, Heft 5–6, 1874, p. 52 (copied). — Jordan and Veale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 348 (Rago Pago and Apia). — Fowler, Occas. Pap. Bishop Mus., vol. 8, no. 7, 1923, p. 386 (Honolulu). — Fowler, Bishop Mus. Bull., no. 22, 1925, p. 34 (Samoa). — Fowler and Ball, Bishop Mus. Bull., no. 26, 1925 (1926), p. 18 (Wake Island).

Holacanthus luteolus Cuvier, l. c., p. 198. Tahiti. — Günther, l. c., plate 40, fig. B.

Holacanthus cyanotis Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 517. Aneiteum, New Hebrides. — Günther, Journ. Mus. Godeffroy, band 2–3, Heft 5–6, 1874, p. 52, plate 40, fig. A (New Hebrides, Ringsmills, Society Islands, Paumotus, Hervey Islands, Samoa, Fiji).

Holacanthus xanthurus Lay and Bennett, Proc. Zool. Soc. London, Fishes, vol. 9, 1839 (1839), p. 457.

(= Apolemichthys griseus, Jenkins. Proc. Linn. Soc. New South Wales, vol. 3, 1915, p. 1101 (Queensland).)

9 or 10 above, 21 or 22 below, 18 to 20 predorsal. Caudal base scaly, fins otherwise naked. Scales 14 or 15 across breast between inner bases of ventrals. Along dorsal base 27 or 28 strong keeled spinescent scales, 22 or 23 along anal base. Scales oblong, with emargination at each end; 7 or 8 vertical parallel basal striae; apical surface entire.

D. VI, 26, second spine 2 1/4 in total head length, soft fin height 4; A. I, 23 or 24, fin height 3 1/3 to 4; caudal 1 3/3, slightly emarginate behind, truncate as expanded; least depth of caudal peduncle 7 to 7 1/5; pectoral rays 15 to 17, length 2 1/4 to 2 1/2 in total head length; ventral 2 to 2 1/6,

including vertical edge, with very narrow black submarginal line. End of caudal peduncle and all of caudal bright orange, tip of fin white, black and blue. Anal black, edge black, an submarginal bluish white band; across spines 3 similar marginal stripes, body of fin speckled with bluish white. Pectoral rays blue black, membranes hyaline. Ventral black medially, olivaceous on 2 last rays with bluish white front and extreme front of spine black.

9673. Talisi Island. November 9, 1909. Length 110 mm.

465, 466, 4833. Buka Island, Gulf of Tomini, Celebes. November 20, 1907. Length 96 to 153 mm.

27683. Gane Road, Gilolo Island. December 1, 1909. Length 35 mm.

spine longer than rays and front edge denticulate, rays 6.

Back brown, sides and below pale to whitish, everywhere with silvery white reflections. Iris silvery white, with neutral gray above. Fins pale brown, lower ones whitish, outer half of spinous dorsal blackish.

After comparison with Atlantic materials from the Gulf Stream and off Porto Rico I am unable to find any tangible distinction for the East Indian form. All the Atlantic materials have lost their scales, though they show much fewer than 67.

front of nostrils, extends close below lower front eye edge, crosses breast near pectoral base and ends on level with ventral bases; head and breast anteriorly pale ochraceous; snout and chin blackish. Middle of side orange, center of each scale with purplish black spot, becomes larger until dominating color on abdominal surface, orange changing to olive yellow. From middle of soft dorsal base downward to about middle of anal, including posterior part of body and caudal peduncle black, speckled with bluish white. Spinous dorsal in front dusky yellow, including both spines and membranes of first four or incised portion, posteriorly fin bright orange, similar to body; bluish white edge runs from fifth spine around and

13 examples. D. 5301. China Sea, vicinity Hong Kong (20° 37' N., 115° 43' E.). In 208 fathoms. August 8, 1908. Length 40 to 83 mm.

1714. D. 5503. Macabalan Point Light (Mindanao), S. 31° E., 6.6 miles (8° 36' 26" N., 124° 36' 08" E.). In 226 fathoms. August 4, 1909. Length 69 mm.

4252. D. 5517. Point Tagolo Light, S. 83° W., 10.5 miles (8° 45' 30" N., 123° 33' 45" E.), vicinity northern Mindanao. In 169 fathoms. August 9, 1909. Length 40 mm.

14 examples. D. 5518. Point Tagolo Light, S. 64° W., 8.7 miles (8° 48' N., 123° 31' E.), vicinity northern Mindanao. In 200 fathoms. August 9, 1909. Length 75 to 91 mm.

3437 to 3439. D. 5542. Tagolo Light, S. 70° W., 13.2 miles (8° 48' 30" N., 123° 35' 30"), vicinity northern Mindanao. In 200 fathoms. August 20, 1909. Length 79 to 90 mm.

9 examples. D. 5402. Capitancillo Island Light, S. 37° W., 16.1 miles (11° 11' 45" N., 124° 15' 45" E.), between Leyte and Cebu. March 16, 1909. In 188 fathoms. Length 62 to 88 mm.

~~4~~ 6 4 examples. D. 5403. Capitancillo Island Light, S. 46° W., 15.7 miles (11° 10' N., 124° 17' 15" E.), between Leyte and Cebu. March 16, 1909. In 182 fathoms. Length 75 to 92 mm.

2285 to 2288.

4 examples. D. 5409. Capitancillo Light, N. 19° W., 22 miles (10° 38' N., 124° 13' 08" E.), between Cebu and Leyte. March 18, 1909. In 189 fathoms. Length 83 to 88 mm.

4314. D. 5420. Cruz Point (Bohol), S. 20° E., 6 miles (9° 49' 35" N., 123° 45' E.), between Cebu and Bohol. March 25, 1909. In 127 fathoms. Length 58 mm.

Zenion leptolepis (Gilchrist and VonBonde)

Cyttus leptolepis Gilchrist and VonBonde, Fisher. Marine Biol. Surv., Rep. No. 3, Special Rep. No. 7, p. 17, 1922 (1924) (type locality, off South Africa, Pickle Station 98, in 218 fathoms, also Pickle Station, 295, in 200 fathoms).

Zenion leptolepis Barnard, Ann. South Afric. Mus., Vol. 21, p. 379, June 1925 (Natal coast and off Delagoa Bay, 180 to 218 fathoms).

Depth 2 1/2; head 2 4/5. Eye 3 in head; premaxillary protractile, fitting into groove between orbits; maxillary reaches eye, expanded behind; mouth very oblique; teeth in jaws small; nostrils near eye, almost in line with top of eye, posterior much larger; interorbital 4 in head.

Scales 90 in lateral line, which almost straight from near upper end of opercle to middle of caudal base.

D. VII, 28, spines weak and without serrations, posterior rays slightly longer, ending before anal end; A. I, 32, begins just behind vent, rays like soft dorsal rays; caudal somewhat bifurcate; pectoral

Scales 5-6 in lateral line; 8 above, 13 below; 4 rows on cheek to preopercle ridge; fins except caudal basally largely naked.

D. X., 11, fourth spine 2 1/4 in head, fifth ray 1 4/5; A. III, 11, third spine 2 4/5, first ray 2 1/3; caudal 1 1/10, emarginate, lobes broad; least depth of caudal peduncle 2 4/5; pectoral 1 1/5; ventral 1 1/4.

Greenish rosy above, below paler. Iris yellowish pink. Head violaceous above. Blackish brown vertical band from eye to interopercle, crossing distinctly over cheek below eye. Fins rose to yellowish. Length 211 mm. (Bleeker.)

Celebes.

rays 15, fin small or longest ray $\frac{4}{5}$ of eye; ventral rays I, 5, spine slightly longer than longest dorsal spine, fin small and triangular.

Coloration not given. Length 160 mm. (Gilchrist and Von Bonde.)

Natal coast and off Delagoa Bay, Portuguese East Africa, in 180 to 218 fathoms.

Cat 179

Gymnocranius microdon (Bleeker)

Dentex microdon Bleeker, Naturk. Tijdschr. Nederl. Indië, vol. 2, 1851, p. 219. Bulucomba, Celebes. 1/3 Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 372 (copied).

Paradentex microdon Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, 1873-76, pl. (30) 308, fig. 3.

Gymnocranius microdon Bleeker, Atlas Ichth. Ind. Neerland., op. cit., vol. 8, 1876-77, p. 98 (Celebes).

Depth 2 2/3; head 3. Snout 2 4/5 in head; eye 3, 1 1/4 in snout, greater than interorbital; maxillary reaches 4/5 to eye, length 3 1/4 in head; teeth in several series, of upper outer 3 or 4 anteriorly and 8 each side slightly enlarged, lower with 3 outer anteriorly and 16 laterally little enlarged; interorbital low, width 3/4 of eye; preopercle edge entire.

Genus Cyttomimus Gilbert

Cyttomimus Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, p. 623, 1903 (1905). (Type, Cyttomimus stelgis Gilbert, orthotypic.)

Body rhomboidal, compressed. Head large, compressed. Snout conic, moderate. Eye large, high, little backward in head. Mouth large, well inclined, lower jaw protruded. Maxillary reaches below eye. Teeth minute, broadly conical or triangular, in very narrow bands in jaws, on vomer and palatines. Gill membranes widely joined to form free fold over isthmus. Gill rakers short broad plates, with roughened edges. Pseudobranchiae large. Branchiostegals 7. Scales

deeper than long. exposed portions vertically linear, cycloid, though exposed surfaces very rough due to numberless minute prickles. Thoracic region wide and flat, without ridge or spines. Lateral line complete. One dorsal, deeply notched, spinous fin well developed and higher than soft fin. Anal with few short spines in front, lobe soft dorsal. Caudal convex. behind. Pectoral small, little below middle in depth. Ventral inserted slightly before pectoral, also little larger.

71367 U.S.N.M. Tokyo. Albatross Collection. Length 180 mm.

75495 U.S.N.M. Wakamoura. Jordan and Snyder. Length 190 mm.

75496 U.S.N.M. Nagasaki. Jordan and Snyder. Length 188 mm.

52865 and 52880 A.N.S.P. Hong Kong. Henry W. Fowler. Length 205 mm. for both.

Cyttomimus stelgis Gilbert

Cyttomimus stelgis Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, p. 624, pl. 80, fig. 2, 1903 (1905) (type locality, near Barbers Point, south shore of Oahu). — Fowler, Mem. Bishop Mus., vol. 10, p. 96, 1928 (copied).

20 examples. D. 5403.

Depth 2; head 2 3/5, width 2 1/10. Snout 2 3/4 in head from snout tip; eye 2 3/4, equals snout, greatly exceeds interorbital; maxillary reaches opposite front eye edge, expansion 2 1/5 in eye, length 1 7/8 in head from snout tip, hind edge emarginate; teeth in narrow villiform band in each jaw, on vomer and palatines, 3 or 4 transversely; interorbital 3 1/8, low, depressed, concave (damaged); 2 finely serrated supraorbital ridges. Gill rakers 1+9, low finely asperous tubercles, 1/2 of gill filaments, which 1/4 of eye.

Scales 56 tubular in lateral line to caudal base and 2 more on latter; 8 above, 16 below, 23 predorsal, 4 oblique rows on cheek.

4821. Batan Island. June 5, 1909. Length 157 mm.

5088. Between Faron and Jesus Point, Luzon. June 21, 1909. Length 219 mm.

5387. Cebu Market. April 6, 1908. Length 153 mm.

7663 [2015]. Mabul Island. September 29, 1909. Length 129 mm.

948 and 1194 [1397 and 1383]. Port Kupon, Leyte Island. March 17, 1907. Length 153-158 mm. From interorbital region backward over nape and down through and behind pectoral base smoky purplish, area becomes brownish forward and on each side bordered by broad white stripe or bar; posterior not quite to dorsal base or half way above lateral line, below ends about level with pectoral base; anterior stripe crosses snout in

Lateral line arched greatly, like dorsal profile of back and falls midway on side of caudal peduncle. Scales with strong complete median vertical keel, with 24 parallel vertical striae; scales entire apically. Enlarged keeled scales along soft dorsal base 1½, same along soft anal base.

D. VIII, 23, second spine 2 1/2 in total head length, soft fin height 4; A. II, 24, first spine 13, soft fin height 3 7/8; caudal 2 1/5, (damaged) apparently convex behind; least depth of caudal peduncle 6½; pectoral 3 2/5; ventral 3, spine 5/6 of fin.

Largely uniform brown. Inside mouth and gill opening pale or brown like rest of body. Spinous dorsal

Ichth. Ind. Neerl., vol. 9, 1877, p. 61, plate (7) 69, fig. 3 (Sumatra, Flores, Solor, Ternate; Ceram, Amboina, Saparua, Banda, Aru, New Guinea). — de Vis Proc. Linn. Soc. New South Wales, vol. 9, 1884, p. 457 (Queensland coast). — Ehra, Cat. Faun. Filip., vol. 1, 1895, p. 489 (Luzon, Manila). — Jordan and Veale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 34 (Manila). — Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 269 (Cagayancillo). — Weber, Siboga Exped., Livr. 65, 1913, p. 312 (Banda). — Fowler, Bishop Mus. Bull., no. 22, 1925, p. 34 (Samoa).

Holacanthus tenigab Thiolliere, Faun. Woodlarks, 1857, p. 169. Woodlark Island. — Ogilby, Mem. Queensland Mus., vol. 3, 1915, p. 103 (Moreton Bay).

blackish basally.

Hawaiian Islands.

U. S. N. M., No. 51622. Type.

Hawaiian Islands. In fathoms.
Albatross Collection
(4122). Length 91 mm.

Depth I 7/8 to 2 I/8; head 3 I/4 to 3 2/5, width 2 I/4 to 2 2/5. Snout I I/4 to I I/3; eye 4 3/4 to 5 7/8, 3 2/5 to 4 I/3 in snout, I 2/3 to I 7/8 in interorbital; teeth I8 to 20 in jaws, moderate; maxillary 4 I/8 to 4 2/3 in head; interorbital 3 to 3 I/8; opercle, preopercle limb and humeral arch with radiating striae, rather fine, not prominent. Gill rakers 8 + I6, short, cuneate, fleshy, flexible.

Scales broadly ovoid, small, narrowly imbricated, circuli extremely fine and numerous; apical denticles I4 to 22, with II to I3 transverse [illegible] series of basal elements more or less complete cusps.

D. IX, 27, I to 29, I, last spine I 4/5 to 2 I/8 in head, nineteenth ray I I/3 to I 2/3; A. III, 25, I to 27, I, third spine 2 I/2 to 2 3/5, nineteenth ray I I/4 to I 2/3; caudal deeply emarginate or lunate, end produced in long points with age, 2 to 3 2/3 in combined head and body; least depth of caudal peduncle 2 2/3 to 2 3/4 in head; pectoral I to I I/IO; ventral I I/6 to I I/3; caudal spine 2 3/5 to 3 I/3.

Cyttomimus affinis Weber

Cyttomimus affinis Weber, Siboga Exped., vol. 57, Fische, p. 298, 1913 (type locality, Arafura Sea, in 304 meters). — Weber and Beaufort, Fishes Indo Austral. Archip., vol. 5, p. 220, fig. 61, 1929 (type).

Largely uniform dusky brown. Iris deep brown. From opercle above orange band, at least wide as eye, horizontally back far as tip of depressed pectoral, and bordered all around with blackish band. Fins largely dusky, hind emargination of caudal with whitish border. Pectoral with hind border pale brownish.

Mauritius, East Indies, Rio Kei, Queensland, Micronesia, Polynesia, Hawaii.

Depth 1 7/8; head 2 1/8, width 2 4/5. Snout 2 1/3 in head from snout tip; eye 2 2/3, 1 1/6 in snout, greatly exceeds interorbital; maxillary reaches opposite front eye edge, expansion 3 in orbit, length 2 1/4 in head from snout tip, hind edge emarginate; teeth uniform, villiform, very small, in 2 or 3 irregular rows in jaws, on vomer and palatines; interorbital 3 1/3 in head from snout tip, deeply concave, low. Gill rakers 2+10, low asperous tubercles, 1/2 of gill filaments, which 5 1/2 in orbit.

Scales 37 in lateral line to caudal base and 3 more on latter;

7805. Bugsuk Island. January 5, 1909. Length 230 mm.

8796. Buta Waman Island. June 12, 1909. Length 277 mm.

7795. Canaraman Island, Balabac. January 4, 1909. Length 388 mm. General color brownish. Several orange red lines before eye. Fins more or less brownish like body. Dorsals and anals with numerous narrow black blue lines or bars posteriorly; outer margins of fins blue. Caudal margin within forks blue, outer edge white. Pectoral tip yellowish.

8794. Gubat Bay. June 23, 1909. Length 205 mm.

8810 and 8811. Maculabo Island. June 13, 1909. Length 363 to 375 mm.

6 above, 12 below, 19 predorsal, 3 rows on cheek. Scales with 22 parallel basal striae, absent apically, where edges more or less rough or irregular. Along soft dorsal base 12 or 13 strong keeled scales; 13 along soft anal base.

D. VIII, 20, second spine 3 1/8 in total head length, soft fin height 4 3/5; A. II, 21, first spine 1 1/2, soft fin height 4 2/3; caudal (damaged) 3.?, apparently truncate.?; least depth of caudal peduncle 7; pectoral 4 1/2.?; ventral 3 1/4.

Uniform brownish, fins similar.

Iris brown.

Arafura Sea.

4799 and 4800. Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length 92 mm.

16232. Cape Kait, Libani Bay, Celebes. December 24, 1909. Length 93 mm.

7980. Dodepao and Pasegoyo Island, Celebes. November 16, 1909. Length 79 mm.

4779 and 13670. Limbe Strait, Celebes. November 10, 1909. Length 82 to 88 mm.

4827. Nadda Island, Celebes. November 17, 1909. Length 84 mm.

22693. Labuandita Bay, Gulf of Boni, Celebes. December 18, 1909. Length 82 mm.

13629. Biabia Kan Island, off Borneo. December 31, 1909. Length 61 mm.

4728. Gane Road, Gilolo Island. December 1, 1909. Length 75 mm.

7973. Tidore Island, south of Ternate. November 24, 1909. Length 76 mm.

3673 and 3674. D. 5441. San Fernando Point Light, S. 87° E., 18.7 miles (16°38'N., 119°57'18"E.), west coast of Luzon. In 186 fathoms. May 10, 1909. Albatross Collection. Length 55 to 65 mm. Two examples in very poor condition.

Depth 2 I/10 to 2 I/3; head 3 I/2 to 3 3/4, width I 7/8 to 2. Snout I I/4 to I I/3; eye 4 2/5 to 4 4/5, 3 I/4 to 3 4/5 in snout, I I/3 to I 3/5 in interorbital; teeth I8 to 20 in jaws, moderate; maxillary 3 7/8 to 4 2/5 in head; interorbital 3 I/5 to 3 I/3, convexly elevated; opercle, preopercle flange and humeral arch with distinct striae. Gill rakers 8 + I7, short, flexible points.

Scales very small, ovoid, closely imbricated, with very minute circuli; apical denticles 7 to I0, with 5 to 7 transverse series basally, mostly as well developed cusps.

D. IX, 22, r to 24, r, last spine 2 to 2 I/4 in head, first ray I 4/5 to 2; A. III, 22, r or 23, r, third spine 2 I/4 to 3, first ray 2 to 2 2/5; caudal deeply emarginate or lunate, points long and slender, extended, 2 I/5 to 2 I/3 in combined head and body; least depth of caudal peduncle 2 3/5 to 2 7/8 in head; pectoral I to I 7/I0; ventral I I/5; caudal spine 2 7/8 to 3 I/4.

Genus Neocyttus Gilchrist

Neocyttus Gilchrist, Marine Investig. South Africa, vol. 4, p. 153, 1908. (Type Neocyttus rhomboidalis Gilchrist, monotypic.)

Body well compressed, rhomboid, elevated. Head moderate. Snout short, obtuse. Eye very large, greater than half of head, advanced and impinging on upper profile. Mouth terminal, small, jaws about even and very protractile. Small teeth in jaws and on vomer, none on palatines or tongue. Surface bones of head with coarse granules and ridges, on opercle with radiating series. Branchiostegals 7. Scales small, ctenoid, mostly imbricate; on nape, head and ventral edge edges turned outward, strongly spinate. Dorsal single, with few short spines in front. Anal similar, with still fewer spines in front, rays also fewer. Caudal rounded behind. Paired fins small, alike, pectoral inserted little below middle in body depth.

15334, 2006. Fort Talapaq.
June 3, 1907. Length 212 to 258 mm.
7406 and 7407. Fort Dson, west of
Pinas Island, Biscayne. December 17,
1908. Length 255 to 263 mm. Brons red
across preorbital. Brons orange behind
eye, across tip of opercle and behind
upper angle. More or less diffuse
transverse lateral bars, only distinct
posteriorly or as 2 on caudal peduncle
and one below soft dorsal. Fins
with vermilion shades.

Analysis of species

a.¹ Lateral line with 104 scales;
interorbital anteriorly bounded by
prefrontals and frontals almost
rectangular. rhomboidalis.

a.² Lateral line with 82 scales;
interorbital anteriorly bounded
by prefrontals and frontals
lanceolate. helgae.

Please return to Natural Sciences Library,
N. Quad & Thurston Hall, Cornell University.

pvel29

Gymnocranius frenatus Bleeker

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Gymnocranius frenatus Bleeker, Verhandel. Kon. Akad. Wetensch. Amsterdam, no. 3, vol. 13, [illegible] 1873, p. 46. Macassar, Celebes; Atti Soc. Ital. Sci. Nat. Milano, vol. 8, 1877-77, p. 17, pl. (55) 333, fig. 3 (Celebes).

Depth 2 2/5. Head 3 1/4. Snout 2 3/4 in head; eye 2 3/4, 1 1/8 in snout, 1 in interorbital; maxillary reaches 2/3 to eye, expansion 2 3/4 in eye, length 3 1/3 in head; jaws equal; upper teeth in several rows and of outer slightly enlarged row 2 or 3 in front and 6 feeble canines; lower front teeth small, in several rows, posteriorly single row of larger conic teeth; interorbital low, equals eye; preopercle edge feebly uneven.

Scales 55 in lateral line; 6 above,

Neocyttus rhomboidalis Gilchrist

Neocyttus rhomboidalis Gilchrist, Marine Investig. South Africa, vol. 4, p. 153, pl. 4 fig. 2, 1908 (off Cape Peninsula, off Cape Point, N. 41° E., 38 miles, 315 to 400 fathoms). — Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 377, June 1925 (off Cape Point, 312 to 600 fathoms).

(Cyttosoma rhomboidalis Holt and Byrne, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 91, 1908 (diagnosis in key).

Neocyttus romboidalis Gilchrist, Fisher. Marine Biol. Surv., Rep. No. 2, Special Rep. No. 3, p. 72, 1921 (1922) (off South Africa, 312 fathoms).

→ Neocyttus rhomboidalis var. gibbosus Mc Culloch, Biol. Res. Endeavour, vol. 2, pt. 3, p. 119, fig. 8, July 3, 1914 (type locality, Great Australian Bight, Long. 129° 28' E., 350–450 fathoms); Rec. Austral. Mus., vol. 5, pt. 1, p. 136, June 29, 1929 (reference).

lobe and pair of similar bands, united anteriorly, from isthmus to lower caudal lobe, passing just outside ventrals and anal bases. Upper lip saffron yellow. Dorsal, anal and paired fins hyaline, first tipped gold. Caudal pink, wide greenish yellow terminal border and filamentous ray brilliant sulphur yellow. Length 298 mm. (Ogilby.)

Queensland.

Depth 1 1/2; head 2 2/3. Snout 4 1/2 in head from snout tip; eye 2, greatly exceeds snout or interorbital; maxillary reaches 1/4 in eye, expansion 3/4 in eye, length 2 3/4 in head from snout tip; interorbital 1 1/4 in eye, low.

Scales about 104 in lateral line. Lateral line arched on trunk, more or less axial along side of tail and caudal peduncle.

D. VII, 33 to 35, second spine 2 1/5 in total head length, twentieth ray 2 1/5; A. III, 30 to 33, first spine 3, twentieth ray 2 1/10; caudal 2 1/8, convex behind; least depth of caudal peduncle 5 2/5; pectoral 2 1/4, rays about 20; ventral rays I, 6; fin 2 in

bases of the dorsals, inclined posteriorly and narrowing below. An caudal peduncle 2 others shown and these inclined little forward.

cm 20
c-d 10 mm. day

Subgenus Gymnocranius Klunsinger

Waved blue lines across snout, cheeks and opercle. Throat and anals rosy, with darker edges.

cm 29

Gymnocranius robinsoni (Gilchrist and Thompson)

Dentex robinsoni Gilchrist and Thompson, Ann. South African Mus., vol. 6, 1908–10, p. 226. Natal coast south of Durban. 1/m

Barnard, Ann. South African Mus., vol. 21, pt. 2, 1927, p. 712 (Natal coast).

Dentex rivulatus (not Bennett 1835) Rüppell, neue Wirbelth. Fische, 1835, p. 116, pl. 29, fig. 2. Djidda, Red Sea. 1/m (Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 372 (copied).

1/m day, Fishes of India, pt. 1, 1875, p. 90.

total head.

Color not given. (Gilchrist.)

South Africa, Great Australian Bight. Barnard gives: D. VII or VIII, 33 to 35; A. III or IV, 30 to 33; color silvery, soft dorsal, anal and ventral blackish; length to 280 mm.

13 below; fins except caudal usually
very dusky naked.

D. X, 11, third spine 2 1/3 in head,
first ray 2 1/5 or slightly longer than
last spine; A. III, 11, third spine 2 1/2,
first ray 2 1/4; caudal l, emarginate,
tips broad; least depth of caudal
peduncle 2 2/5; pectoral 1 1/8; ventral 1 1/3.

Above olivaceous rosy, bases of scales
deeper. Below golden rosy or yellowish,
bases of scales paler. Iris yellowish
or rosy. Snout, lefront and lips deep
violaceous; a rein golden band from
above snout tip, includes nostrils, to
eye. Fins rosy or golden, caudal sparsely
dusky on lobes and spinous dorsal
clouded violaceous. Length —

(Bleeker.)

Bleeker's figure shows 7 dark brown
transverse bands on the body from the

Neocyttus
~~Cyttroma~~ helgae (Holt and Byrne)

Cyttroma helgae Holt and Byrne, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 91, ~~1908~~ pl. 3, 1908 (type locality, lat. 51° 36' N., long. 11° 57' W., 540 to 660 fathoms, off southwest coast of Ireland).

Depth 1 1/3; head 3. Snout 3 1/8 in head from snout tip; eye 2 2/3, greater than snout, equals interorbital; maxillary not quite reaching eye, expansion 3 1/8 in eye, length 3 1/2 in head; preorbital depth 1 4/5 in eye.

Scales 82 in lateral line of which 4 on caudal base; 16 above, 35 below, 18 between pectoral and ventral bases. Scales smaller and crowded on anterior parts of sides. Scales ctenoid. No bony scutes or

tubercles. Lateral line arched moderately anteriorly or on trunk, axial along side of tail and median along side of caudal peduncle.

D. VII, 34, second spine 2 1/8 in head, eighteenth ray 2 1/8; A. IV, 30, first spine 2 1/8, twelfth ray 2; caudal 1 2/5, convex behind; least depth of caudal peduncle 3 3/4; pectoral 2 1/8, rays 19; ventral rays I, 6, fin 2 1/8 in head.

Pale gray, bluish about belly. Branchiostegal membrane deep black, showing beyond opercle. Iris black, pupil transparent black. Mouth black. Dark blue gray on dorsal, anal, caudal and ventral. Length 89 mm.

(Holt and Byrne.)

Off southwest Ireland. Only the type known.

Genus Cyttula Weber

Cyttula Weber, Siboga Exped., vol. 57, Fische, p. 411, 1913. (Type Cyttula macropus Weber, monotypic.)

Body moderately long, compressed, dorsal profile anteriorly nearly straight, lower profile convex. Head large, with mucous cavities. Snout moderate. Eye large, high, slightly posterior in head. Jaws very protractile, lower nearly vertical when mouth closed. Maxillary not reaching below eye. Small teeth on jaws and vomer. Part of opercular and head bones finely serrated. Gills 3 1/2, no slit behind fourth arch. Gill rakers short, few. Branchiostegals 7.

Scales very small, ctenoid, cover whole body. Lateral line with enlarged scales. No bony plates. Head naked. Dorsal continuous, with 6 short, small spines in front. Anal with 2 spine, soft fin with long base, like soft dorsal. Caudal moderate. Pectoral short, low. Ventral very long, reaches beyond caudal base, with spine and 6 rays.

One species.

Cyttula macropus Weber

Cyttula macropus Weber, Siboga Exped., vol. 57, Fische, p. 411, pl. 2, figs. 3-3a, 9, 13 (type locality, lat. 7°19.4'S., long. 116°49.5'E., Flores Sea, 538 meters).

— Weber and Beaufort, Fishes Indo Austral. Archip., vol. 5, p. 221, fig. 62, 1929 (type).

Depth 2 1/5; head 2 1/6. Snout 3 4/5 in head from snout tip; eye 2 1/5, greatly exceeds snout; maxillary vertical, extends about 2/5 in snout, length 2 4/5 in head from snout tip; interorbital low.

Scales about 30 in lateral line, which axial along side of body and scarcely curved.

D. VI, 26, second spine about 3 1/8 in total head, soft fin height posteriorly 4; A. II, 25, soft fin height posteriorly 7 1/2; caudal 1 1/3, convex behind; least depth of caudal peduncle 3 1/3; pectoral 4 1/3, ventral 1 1/3; anal 1 1/3 from pelvic origin; pectoral, with rather pointed tip, reaches vertical through origin of dorsal, ventral

South Africa, Natal. Possibly Pagellus armatus Castelnau is this species. It is said to resemble greatly Pagellus afer Poppe but form little more elongate. Body rose violet, below whitish. No trace of transverse bands on body; caudal and upper pectoral border somewhat pink. Iris silvery white. Teeth biserial; 2 canines each side in both jaws. D. XI, 11; A. III, 8; P. 15; V. I, 5; C. 17.

53034 A.N.S.P. Port St. John, Natal coast, 3 miles out in 8 fathoms. H. W. Bell Marley. Length 107 mm.

fourth anal ray, last ray produced
to a filament of variable length.

Brown, silvery below. Head colorless, bones transparent. dorsal and ventrals darks. Length 68 mm. (Weber and Beaufort.)

East Indies.

Scales 57 in lateral line to caudal base and 9 more on latter; 8 above, 17 below, 36 predorsal; 8 rows across cheek to preopercle ridge. Scales with 10 or 11 basal radiating striae; 76 to 81 apical denticles, with 2 to 4 transverse series of basal elements; circuli fine.

D. XII, 9, I, fifth spine 3 in head, first ray 4; A. III, , I, second spine 3 1/8, first ray 4; caudal 1 2/5, widely emarginate; least depth of caudal peduncle 3 4/5; pectoral 1 2/7; ventral 1 7/8.

Mauve pink, darker on back and over and behind eye. Some mauve and pinks at corner of upper lip and above. Pectoral, dorsal and anal pinks at tips, caudal darker, with pale gamboge on fringe. Ventral pale mauve pinks. Anal darker. Eye silvery, with pinks. Cheeks and belly white.

Genus Allocyttus Mc Cullock

Allocyttus Mc Cullock, Biol. Res. Endeavour, vol. 2, pt. 3, p. 114, July 3, 1914. (Type Cyttosoma verrucosum var. propinquus Mc Cullock, orthotypic.)

Body compressed, deeply ovoid. Head large. Snout moderate. Eye high, midway in head length, moderate. Mouth moderate, vertically inclined, mandible protruding. Jaws very protractile. Maxillary not quite reaching eye. Small teeth in jaws, uniserial or biserial, also on vomer, none on palatines or tongue. Branchiostegals 7. Scales rather small, with strongly ctenoid edges which turned outward, imbricate on sides and hinder half of body only, on nape and abdomen simply juxtaposed, angular and each with small raised central tubercle; some enlarged flat scales irregularly biserial below

pectoral fin; none below origin of dorsal. Surface bones of head with granules and coarse ridges, formed as radiating ridges on opercle. Lateral line complete. One dorsal, with few short spines forward. Anal similar, with fewer spines and rays. Caudal rounded behind. Paired fins similar, pectoral placed little below middle in body depth.

5164 and 5165. Iloilo market.

June 1, 1908. Length 198 to 218 mm.

21163. Jolo market. February 11, 1908.

Length 80 mm.?

5963. Little Santa Cruz Island.

May 26, 1908. Length 686 mm. Olivaceous above, whitish below, margins of scales darkest. Maxillary and premaxillary membranes scarlet. Inside mouth posteriorly scarlet. membrane of soft dorsal reddish. Anal less so. Slight reddish tinge on caudal tips.

8508. Makesi Island, Palawan.

April 5, 1909. Length 280 mm.

Allocyttus verrucosus (Gilchrist

Cyttosoma verrucosum Gilchrist, Marine Investig. South Africa, vol. 4, p. 151, pl. 40, 1908 (type locality, About 30 miles off Cape Point, in 600 fathoms).

Allocyttus verrucosus Gilchrist, Fisher. Marine Biol. Surv., Rep. No. 2, Special Rep. No. 3, p. 71, 1921 (1922) (off South Africa, 324 to 537 fathoms). — Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 378, June 1925 (off Cape Point; south of Agulhas Banks; Natal coast; 324 to 890 fathoms).

Cyttosoma verrucosum Holt and Byrne, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 90, 1908 (diagnosis in key).

ventral axillary scaly flap long as or little longer than eye.

D. X, 9, last spine 2 2/5 to 2 1/2 in head, seventh ray 1 2/3; A. III, 7, third spine 2 4/5 to 3, sixth ray 2 1/10; caudal 1 1/8, forked, lobes pointed; least depth of caudal peduncle 2 4/5; pectoral 1; ventral 1 1/10.

Roseate above, sides iridescent pink, pearly white below. Sides below lateral line with 5 greenish yellow horizontal bands, each along scale rows medianly, upper and lower bands shorter and less conspicuous than intervening bands. Brilliant crimson shoulder spot covers upper half of 2 consecutive scales or from second and third to fourth and fifth below lateral line. Head above tinged lavender over pink. Curved light-

Allocyttus verrucosus var. *propinquus* McCulloch, Mem. Austral. Mus., vol. 5, pt. 1, p. 135, June 29, 1929 (type locality, Great Australian Bight, 129°28' E., 350 to 450 fathoms).

Cat. 29 Synagris theodorei (Ogilby)

Hemipterus theodorei Ogilby, Proc. Roy. Soc. Queensland, vol. 28, 1916, p. 113. Caloundra Bombs, South Queensland; Mem. Queensland Mus., vol. 6, Dec. 19, 1918, p. 55, pl. 19 (Caloundra Bombs).

Depth 3 1/8; head 3 2/5. Snout 2 1/2 to 2 2/3 in head; eye 3 2/3 to 4, 1 1/5 to 1 2/3 in snout, greater than interorbital, subequal with preorbital depth; maxillary reaches 4/5 to eye, length 2 2/3 to 2 4/5 in head; jaws even; 8 upper front canines, none below but medio lateral teeth little enlarged; interorbital 4 1/2 to 5, little convex; preopercle edge entire. Gill rakers 5 + 7, short, stout, strongly spinulose, 5 1/2 in eye.

Scales 48 in lateral line; 3 above, 9 below, 3 rows on cheeks, 11 predorsal forward opposite hind eye edge;

Depth 1 3/5; head 2 1/4. Snout to orbit 3 1/5 in head from snout tip, to eye 2 4/5; eye 3, equals snout; orbit 2 1/4 in head from snout tip; maxillary reaches 1/3 in eye, expansion 1 1/2 in eye, length 2 1/4 in head from snout tip; premaxillary protrusible, received into horse shoe shaped fontanel extending backwards between eye centers; interorbital 2 1/2 in eye, low. Gill rakers 20 below.

Scales 95 in lateral line, which highly arched on trunk, axial along side of tail and caudal peduncle; 12 above, 36? between lateral line and spinous anal origin.

Clupea, vol. 10, 1910, p. 48 (Honolulu).
— Malpas, Ceylon Administrat. Rep., 1921, p. E8.
Monotaxis grandoculis Bleeker, Atlas Ichth. Ind. Neerland., vol. 7, 1873-76, pl. (21) 299, fig. 1; vol. 8, 1876-77, p. 105 (Sumatra, Batu, Celebes, Halmahera, Obi major, Amboina). 1/m Jenkins, Bull. U.S. Fish Comm., vol. 22, 1902 (1903), p. 453 (Honolulu). 1/m Snyder, Bull. U.S. Fish Comm., vol. 22, 1902 (1904), p. 527 (Honolulu). 1/m Jordan and Evermann, Bull. U.S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 243, fig. 101 (Honolulu, Kailua, Koolau, Hawaii). 1/m Veale, Occas. Pap. Bishop Mus., vol. 4, no. 1, 1906, p. 46 (Tubuai, Tahiti, Rhorttand Island). 1/m Jordan and Veale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 277 (Lepia). 1/m Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 291, (Upolu, Manahiki Island). 1/m Fowler, Copeia, no. 114, November 20, 1922, p. 53 (Hawaii); Bull. Bishop Mus., vol. 22,

D. VI, 31, third spine 5 1/4 in total head length, fifteenth ray 2 1/3; A. III, 29, first spine 7, fifteenth ray 2 1/3; caudal 2 1/8, convex behind; least depth of caudal peduncle 6; pectoral 2 1/5, rays 20; ventral rays I, 6, fin 2 1/8, spine 3/4 of fin, strong.

Color not given. (Gilchrist.)

South Africa, Natal, Great Australian Bight. According to Barnard reaches 325 mm.; preserved specimens brownish and rounded blotches in the young.

pts. 5–6, 1874, p. 67 (Hawaiian, Society, Friendly, Samoa, Kingsmills, Fiji and Pelew Islands). 1/m Schmeltz, Cat. mus. Godeffroy, No. 5, 1874, p. 24 (Port Elliot, Australia); No. 7, 1879, p. 40 (Repolu; Queensland). 1/m Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 34 (Kandavu, Fiji), p. 56 (Cross Harbor, Admiralty Islands). 1/m Kröyer, Tidsskr. Fiskeri, Kjöbenhavn, vol. 5, 1881, p. 157 (Ceylon). 1/m Macleay, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 264 (Engineer Group, New Guinea). 1/m Klunzinger, Fische Roth. Meer., 1884, p. 41. 1/m Meyer, Mem. Soc. Españ. Hist. Nat. Madrid, vol. 14, 1885, p. 19 (North Celebes; Kordo, Mysore). 1/m Day, Fishes of India, Suppl., 1888, p. 787; Fauna British India, Fishes, vol. 2, 1889, p. 41. 1/2m Waite, Mem. Australian Mus., No. 3, 1897, p. 186 (Funafuti, Ellice Islands). 1/m Steindachner, Denkschr. Akad. Wiss. Wien, Math.-Naturw.

Genus Cyttosoma Gilchrist

Cyttosoma Gilchrist, Marine Investig. South Africa, vol. 3, p. 6, March 1, 1904. (Type Cyttosoma boops Gilchrist, monotypic.)

Body compressed, upper profile concave, deep. Head large, moderately compressed. Snout moderate. Eye very large, high, in posterior half of head. Upper jaw greatly protractile, its extension capable of ½ times its normal distance from eye. Lower edges of mandible serrate, nostrils close together at front of anterior protuberance of supraorbital ridge. Opercle entire. Gill opening large. Minute teeth in lower jaw, none in upper, or on vomer or palatines. Gill rakers stout, short, leaf like. Pseudobranchiae well developed. Scales small, deciduous, replaced by bony tubercles on head, predorsal,

thorax and abdomen, and by hard spiny scales along bases of dorsal and anal fins. Dorsal deeply notched, low, spinous fin small. Anal notched, spinous fin very small. Caudal small, rounded behind. Paired fins small, pectoral little below middle in body depth.

South Africa and Australia.

yellow stripe from above pectoral base out on caudal peduncle, less distinct sulphur yellow stripe begins on shoulder passes backward under lateral line - and crosses same on caudal peduncle to end at caudal base. Yellow bar across postorbital connects behind snout. Premaxillaries yellowish. Lower border of opercle slightly yellow. Dorsal hyaline rosy, edges of membranes bright sulphury with pale purple submarginal bar. Caudal bright rosy, upper lobe with produced rays tipped cadmium. Pectoral pinks. Ventral

Cyttosoma loops Gilchrist

Cyttosoma loops (Gilchrist, Marine Investig. South Africa, vol. 3, p. 6, pl. 230, March 1, 1924 (type locality, Vasco de Gama Peak (near Cape Point) bearing N. 40° E., distance 13½ miles, in 120 fathoms); vol. 4, p. 150, 1907 (Cape Point Lighthouse bearing N.E. ¾ E., distant 29 miles, 470 fathoms). — McCulloch, Biol. — Holt and Byrne, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 90, 1908 (diagnosis in key).

p. 76, fig. 115 (copied), Report 23, 1921 (reference). — McCulloch, Mem. Australian Mus., vol. 5, pt. 1, p. 135, June 29, 1929 (reference).

Gilchrist and Von Bonde, Fisher. Marine Biol. Survey., Rep. no. 3, Special Rep. no. 7, p. 17, 1922 (1924) (off South Africa, 280 to 760 fathoms). — Barnard, Ann. South Afric. Mus., vol. 21, p. 375, June 1925 (off Table Bay, Cape Point, Natal, 120 to 760 fathoms).

Cyttosoma Loopsi Gilchrist

Cyttosoma Loopsi Gilchrist, Marine Investig. South Africa, vol. 3, pt. 6, pl. 23 f, March 1, 1904 (Type locality, Vasco de Gama Peak (near Cape Point) bearing N. 40° E, distance 13½ miles, in 1120 fathoms); vol. 4, p. 150, 1907 (Cape Point Lighthouse bearing N.E. ¾ E, distant 29 miles, 470 fathoms). V— Mc Culloch, Biol. Res. Endeavour, vol. II, p. 3, p. 113, July 3, 1914 (Great Australian Bight, 450 fathoms). — Waite, Rec. South Austral. Mus., vol. 2, No. 1, p. 76, fig. 115 (copied), April 23, 1921 (reference). — Mc Culloch, Mem. Austral. Mus., vol. 5, pt. 1, p. 135, June 29, 1929 (reference).

— Gilchrist and Von Bonde, Fisher. Marine Biol. Survey., Rep. No. 3, Special Rep. No. 7, p. 17, 1922 (1924) (off South Africa, 280 to 760 fathoms). — Barnard, Ann. South Afric. Mus., vol. 21, p. 375, June 1925 (off Table Bay, Cape Point, Natal, 120 to 760 fathoms).

Analysis of ~~the~~ species 6 pt ann
ca

a.' Lethrinella. Snout extremely long an
pointed ' maxillary but half way to ...

Depth about 1 3/4; head 2 1/2.
Snout greatly protractile, evidently
less than eye; orbit 1 1/2 in head,
eye about 2 1/5; maxillary
reaches about 1/2 in orbit, 2 1/3?
in head; interorbital 1 3/4 in eye,
~~lower ridges of mandible serrate;~~
~~opercles serrate.~~ very low.

Scales 100 in lateral line,
which arched on trunk then paralled
more or less with upper profile
until falling midway in last
half of tail, when median to
caudal base. Along dorsal base
40 low scutes, each with low spine
and same along anal base.

D. VII, 29, fourth spine 2 in
orbit, eleventh ray 1 1/2; A. III, 28,
second spine 4, fifth ray 1 2/3;
least depth of caudal peduncle

Cat 129 Monotaxis grandoculis (Forskål),

Variola grandoculis Forskål, descript. animal., 1775, pp. XII, 53. Djidda, Red Sea.

1/2 Bonnaterre, Tabl. Ichth., 1788, p. 125 (Red Sea). 1/2 Gmelin, Syst. nat. Linn., vol. 1, 1789, p. 1305 (Arabia). 1/2 Walbaum, Artedi Pisc., vol. 3, 1792, p. 311 (on Forskål).

Sparus grandoculis Schneider, Syst. Ichth. Bloch, 1801, p. 276 (on Forskål). 1/2 Lacépède, Hist. nat. Poiss., vol. 4, 1802, pp. 35, 112 (Arabia).

Chrysophrys grandoculis Valenciennes, Hist. nat. Poiss., vol. 6, 1830, p. 134 (on Forskål).

Sphaerodon grandoculis Rüppell, Neue Wirbelth. Fische, 1835, p. 113, pl. 28, fig. 3 (Djedda). 1/37 Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 465 (Red Sea).

1/m Klunsinger, Verhandel. zool. bot. Gesells. Wien, vol. 20, 1870, p. 756 (Koseir, Red Sea).

1/m Günther, Journ. Mus. Godeffroy, vol. 1/2-3,

3 3/4; pectoral rays about 19, fin apparently 4/5 of eye; ventral spine 1/3 in orbit, rays I, 7.

Color not given. (Gilchrist.)

South Africa, Natal, Great Australian Bight, According to Barnard the D. VI to VIII, 29 to 31; A. III, 28 to 30; color dark brownish; length to 207 mm.

Carl 30

Genus Monotaxis Bennett

Monotaxis Bennett, Life of Raffles, 1830, p. 678. Type Monotaxis indica Bennett, monotypic.

Xiphaerodon Rüppell, Neue Wirbelthiere, Fische, 1835, p. 112. Type Xiaena grandoculis Forskål, monotypic.

Upper front profile steep, strongly convex. Eye large. Teeth in front of each jaw conic; in several rows, outer row of conic canines; molars uniserial laterally and posteriorly. Branchiostegals 6. Pyloric coeca 3. Vertebrae 14, of which caudal. Scales moderate. Cheeks scaled. Dorsal spines 10, rays 10 or 11. Anal spines 3, rays 9 to 10.

A single species, valued as a food fish.

Genus Pseudocyttus Gilchrist

Pseudocyttus Gilchrist, Marine Investig. South Africa, vol. 4, p. 152, 1906. (Type Pseudocyttus maculatus Gilchrist, monotypic.)

Body compressed, elevated, rhomboid, upper front profile straight. Head moderate. Snout short, obtuse. Eye large, advanced. Mouth moderate, lower jaw protruding. Maxillary reaches below eye. Few feeble teeth in jaws, none on palate. Gills $3\frac{1}{2}$, no opening behind last. Pseudobranchiae well developed. Branchiostegals 6.

Scales small, deciduous, cycloid, replaced by tubercles on dorsal and ventral regions but

without enlarged tubercles.
No scutes along belly. Dorsal low, with 6 short spines. Anal spines 2. Soft dorsal and anal low, alike, posterior rays little higher, both with long bases. Caudal small, rounded behind. Paired fins small, short. Ventral with spine and 5 rays, not received in groove.

One species.

Pseudocyttus maculatus Gilchrist

Pseudocyttus maculatus Gilchrist, Marine Investig. South Africa, vol. 4, p. 153, pl. 41, 1908 (type locality, off Cape Point N. 41° E., 38 miles, in 315 to 400 fathoms).

Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 376, June 1925 (compiled).

— Holt and Byrne, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 89, 1908 (note).

Depth 1 $\frac{3}{4}$; head 2 $\frac{4}{5}$. ~~width~~ Snout 3 $\frac{1}{2}$ in head from snout tip; eye 2 $\frac{3}{4}$, greater than snout or eye; maxillary reaches $\frac{1}{5}$ in eye, expansion 2 $\frac{1}{3}$ in eye, length 2 $\frac{4}{5}$ in head from snout tip; interorbital low, width 1 $\frac{1}{5}$ in eye; preorbital depth 3 $\frac{1}{3}$ in eye.

Scales about 100 in lateral line; about 18 above, 40 below. Caudal base scaly. Lateral line arched on trunk, falls median about middle of tail and along caudal peduncle.

D. VI, 34, first spine 3 $\frac{3}{5}$ in total head, fin height posteriorly 2 $\frac{3}{4}$; A. II, 31, first spine 4 $\frac{4}{5}$, fin height posteriorly 3 $\frac{1}{4}$; caudal 2, convex behind; least depth of

sloping, gently convex. Snout thick and prominent with age, forms "nose" depending over upper lip; eye 4½ to 5 in head, 1 3/4 to 2 in snout, 1 1/2 in interorbital, slightly less than preorbital depth; 4 canines in each jaw, sometimes also 2 small median ones in lower jaw; row of large conic molars on side, with smaller series within; preorbital scaleless, hind edge nearly vertical, lower hind angle behind mouth angle, lower edge concave, at least with age. Slit reaches to below on first arch.

Scales 62 to 65 in lateral line, 10 to 12 above, 21 to 24 below, 16 rows on cheek and preopercle flange largely scaly.

D. XII, 10, spines strong, not filamentous, third to fifth longest; A. III, 8, spines

caudal peduncle $4\frac{7}{8}$; pectoral $2\frac{1}{3}$, rays 20; ventral $\underline{\underline{I}}$, 5, fin 2 in. total, head.

Gray, with large dark spots. Length not given (figure 156 mm. long). (Gilchrist.)

South Africa. Only known from the type, now believed to be lost.

cont'd

Sparus nasutus (Castelnau)

Chrysophrys nasutus Castelnau, Mém. Poiss. Afrique Australe, 1861, p. 24. Table Bay; Record London Internat. Exhib., pt. 7, no. 5, 1873, p. 7 (Cape of Good Hope).

Pagrus nasutus Duncard, Ann. South African Mus., vol. 21, pt. 2, 1927, p. 675, pl. 21, fig. 2 (False Bay, Umkuka Banks, Natal, in 40 fathoms).

Pagrus major ripinnis Boulenger, Ann. South African Mus., vol. 3, 1903, p. 167, pl. 7. Natal coast. 1/21 Gilchrist and Thompson, Ann. South African Mus., vol. 6, 1908-11, p. 167 (Natal); Ann. Durban Mus., vol. 1, pt. 4, 1917, p. 362 (reference). 1/21 Thompson, Marine Biolog. Rep. South Africa, vol. 4, 1916, p. 86. 1/21 Van Bonde, Fisher. Marine Surv. South Africa, Special Rep. no. 1, 1923, p. 20.

Depth 2 1/3 to 2 1/2; head 2 4/5; profile

Genus Zen Jordan

Zen Jordan, Proc. U. S. Nat. Mus., vol. 26, p. 694, 1903. (Type, Cyttopsis itea Jordan and Fowler, orthotypic.)

Body deeply ovate, strongly compressed. Head deep, front profile steep, obliquely convex. Snout long. Eye small, high. Mouth low, rather small, greatly protractile. Teeth villiform, in narrow band in each jaw. Preopercle entire, angle very wide, convex. Gill opening large. Gill rakers short. No slit behind fourth gill arch. Branchiostegals 7. Scales small, cycloid. Breast broad, flat, imperfectly shielded. Row of

bony bucklers from gill opening to vent, each with spine. Spinous scales along bases of soft dorsal and anal small or obsolete. Lateral line complete. Dorsal spines strong, without filament. Soft dorsal and anal low, alike. Caudal small. Pectoral small, median in body depth. Ventral inserted little before pectoral origin.

Two species.
Synopsis of Species

a. Body with sides uniform whitish. itea.

a². Dark spot on lateral line. cyprinoides.

blue bar from eye front, passes along upper preorbital edge and anteriorly changes deep violet; similar less conspicuous one along its lower edge; upper lip yellow. Cheeks and opercles pink, with golden reflections. Greenish blue spot, preceded by purplish spot, behind upper preopercle angle. Lower 2/3 of iris scarlet, upper third green. Dorsal pink, bordered by broad gold edged puce band. Caudal pinkish yellow, broadly tipped rose, upper rays edged gold and lower rose. Anal with basal half yellow, terminal half lilaceous silvery, former traversed by basal and 2 median pale blue bands. Paired fins colorless. Length to 267 mm.

(Ogilby.)

Queensland.

Gen itea (Jordan and Fowler)

Cyttopsis itea Jordan and Fowler, Proc. U. S. Nat. Mus., vol. 25, p. 519, fig. 1 (snout shown distorted) 1902. (type locality, Suruga Bay.

Gen itea Jordan, Proc. U. S. Nat. Mus., vol. 26, p. 694, fig. 3 (copied) 1903.

— Jordan, Tanaka, Snyder, Journ. College Sci., 1913, p. 207 (reference).

Depth 2 1/10; head 2 1/3, width 3 1/4. Snout 1 7/8 in head from snout tip; eye 3, 1 3/4 in snout, greatly exceeds interorbital; maxillary reaches 3/5 to eye, expansion 1 4/5 in eye, length 2 2/3 in head from snout tip; teeth in villiform bands in jaws, transversely 4 or 5 above and 10 below; interorbital 4 3/5, low, rather deeply concave; nostrils slit like, hind one 2 1/2 times front one. Gill rakers 2 + 9, low spinescent tubercles, 1/2 of gill filaments which 1/4 of eye.

Scales uniform, very small, well imbricated; 72 tubular in lateral line to caudal base and 4 more on latter; 8 above, 42 below, 25 predorsal, 15 rows transversely across cheek. Scales with 23 circuli;

Holacanthus diacanthus (Boddaert).

Chaetodon diacanthus Boddaert, Descr. Epist. Chaet., 1772, p. 19. Amboina; Moluccas. — Boddaert, Schrift. Gesells. Naturf. Fr. Berlin, band 3, 1772, p. 459. — Walbaum, Arted. Pisc., vol. 3, 1792, p. 420. — Schneider, Syst. Ichth. Bloch, 1801, p. 220.

Holacanthus diacanthus Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 48 (Mauritius, Amboina, Ceram). — Playfair, Fishes of Zanzibar, 1866, p. 37 (Zanzibar). — Klunzinger, Verh. Zool. bot. Ges. Wien, band 20, 1870, p. 786 (Kosseir). — Günther, Cruise of Curacoa, Brenchley, 1873, p. 410 (Misol, Moluccas). — Bleeker, Ned. Tijds. dierk., deel 4, 1874, p. 117 (China). — Day, Fishes of India, pt. 1, 1875, p. 113. — Günther, Journ. Mus. Godeffroy, band 2-3 left 5-6, 1874, p. 50, plate 40, fig. B (Samoa, Society Islands, Paumotus). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 9, 1877, p. 65, plate (6)

apically entire.

D. VII, 30, third spine 2 3/4 in total head length, fin height 4 1/6; A. I, 30, fin height 4 1/4; caudal 2 1/5, convex behind; least depth of caudal peduncle 9; pectoral 3 1/8; ventral 1 2/5.

Back pale brown, greater portion below silvery white. Iris silvery white. Fins pale to whitish. Ventrals dark neutral gray terminally.

Japan.

U. S. N. M., No. 50562. Sumiga Bay, Japan. Albatross Collection. Length 148 mm. Type of Cyttopsis itea.

Holacanthus xanthurus Bennett.

Holacanthus xanthurus Bennett, Proc. Comm. Zool. Soc. Lond'n, 1832, p. 183: Mauritius.
Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 51 (type).

Preopercle spine smooth, reaches pectoral base. Scales 46 in lateral line; 7 above, 22 below. D. XV, 19; A. III, 18; dorsal and anal rounded behind. Brownish, each scale with light crescent shaped streak. Caudal yellow. (Günther.)

Possibly not distinct

Zen cypho Fowler

Zen cypho Fowler, Proc. Acad. Nat. Sci. Philadelphia, vol. 85, p. 350, fig. 103, January 20, 1934 (type locality, Off northern Mindanao, in 169 fathoms).

Depth 1 3/4; head 2 1/8, width 2 4/5. Snout 1 3/4 in head from snout tip; eye 3 3/4, greatly exceeds interorbital; maxillary reaches 1/2 eye, expansion 1 4/5 in eye, length 2 1/5 in head from snout tip; upper lip width slightly greater than pupil diameter; teeth villiform, in narrow band in each jaw, about 6 transversely above and 4 below; interorbital 4 7/8, concave; supraorbital edges serrate, with serrae larger anteriorly. Gill rakers 2+9, low, finely spinescent tubercles, 2 1/4 in gill filaments, which 3 in head.

Scales 55 in lateral line to caudal base and 5 more on

latter; 10 above, 34 below, 24 predorsal, 14 on cheeks. Dorsal scutes along each side of soft dorsal base 25 or 26; row of 4 abdominal; 28 or 29 along each side of soft anal base. Lateral line arched high at first, slopes down till midway only on side of caudal peduncle. Scales with 30 very short, feeble, ill defined marginal striae; circuli 30, incomplete apically.

D. VII, 29, second spine $2\frac{1}{2}$ in total head, soft fin height $3\frac{1}{2}$; A. I, 30, spine 7, soft fin height $4\frac{1}{2}$; caudal length $2\frac{1}{8}$, slightly convex behind; least depth of caudal peduncle $8\frac{7}{8}$; pectoral $3\frac{1}{5}$; ventral $1\frac{1}{2}$; pectoral rays 13.

Back light brown, greater lower half of body bright silvery white. Iris silvery white. Fins all pale to whitish. Ventrals milk white, membranes dark brown terminally. On lateral line opposite middle of soft dorsal and anal mostly below lateral line, round gray brown spot, not greatly contrasted, little larger than eye.

Philippines.

U. S. N. M., No. 93140. D. 5517. Point Jayolo Light, S. 83° W., 10.5 miles (Lat. 8° 45' 30" N., long. 123° 33' 45" E.), vicinity northern Mindanao. In 169 fathoms. August 9, 1909. Length 112 mm. Type.

Genus Cyttopsis Gill

Cyttopsis Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 126. (Type Zeus roseus Lowe, monotypic.)

Body well compressed, elevated. Head moderate. Snout rather long. Eye large. Maxillary subvertical, scarcely reaches eye. Mouth protractile. Teeth small, in villiform bands in jaws and on vomer. Gill openings wide. Branchiostegals 7. Scales only in lateral line and adjacent. Abdominal scutes 3 or 4 between ventrals and vent, anterior armed with strong spines directed backward. No bony plates at bases of vertical fins. Dorsal spines 8, stout, striated,

dinal with 1 or 2 short spines, stout, immovable. Caudal with 14 rays. Pectoral moderate, obtuse. Ventral inserted below pectoral, remarkably long, extend behind anal spine.

One species in the Atlantic.

Cyttopsis roseus (Lowe)

Zeus roseus Lowe, Proc. Zool. Soc. London, vol. 2, p. 85, 1843 (type locality, Madeira).
Cyttus roseus Günther, Cat. Fish. Brit. Mus., vol. 2, p. 396, 1860 (type?). — Vaillant, Exped. Travailleur et Talisman, Poiss., p. 349, 1888 (off Morocco, 410 meters).
→ Goode and Bean, Oceanic Ichth., p. 227, 1895 (compiled)

Cyttopsis roseus

Depth 2; head 2 1/2. Snout over 2 in head; eye 3; interorbital slightly concave, striated; upper orbital edge with 30 minute serrae, pointing backward, anterior 5 or 6 of which best developed.

Scales 53 in lateral line; 9.? above, 40.? below. Abdominal scutes 3 or 4, all postventral.

D. VIII, 27, third spine 1/3 body depth, first ray lowest others graduated longer to tenth; A. I, 25, like soft dorsal; caudal abruptly truncate; pectoral rays 13; ventral rays I, 7.

Silvery, rosy above and below. Iris yellowish. Ventral membranes black, rays white. Length 150

cwl 179

Sparus laniarius (Cuvier)

Pagrus laniarius Cuvier, Hist. Nat. Poiss., vol. 6, 1830, p. 169. Cape of Good Hope. 1/m

Pappe, Synopsis Edible Fishes Cape, 1853, p. 20 (east and south Cape Town). 1/m Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 467 (Cape; False Bay). 1/m Kner, Reise Novara, Fische, 1865, p. 85 (Cape of Good Hope). 1/m Gilchrist, Marine Biolog. Rep. South Africa, no. 3, 1916, p. 6 (egg). 1/m Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, 1917, p. 362 (references). 1/m Thompson, Marine Biolog. Rep. South Africa, no. 4, 1918, p. 86. 1/m Von Bonde, Fishes Marine Invert. South Africa, Special Rep. no. 1, 1923, p. 20. 1/m Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 207 (Port St. John, Natal coast). 1/m Barnard, Ann. South African Mus., vol. 21, pt. 2, 1927, p. 694, fig. 24 (head) (Table Bay, False Bay, Agulhas Banks, Algoa Bay, to 45 fathoms)

mm.

(Vaillant.)

Eastern Atlantic. The specimen briefly noticed by Gunther as "Probably type of the species" is 280 mm. It differs a little in having: 27 soft dorsal rays, D. II/29; V. I, 8.

Cru 20

Coun cab

Subgenus Chrysoblephus Swainson

Front teeth in each jaw conic canines, sometimes wearing obtuse with age. Dorsal spines moderate, not produced or elongated.

Genus Paracyttopsis Gilchrist and Von Bonde

Paracyttopsis Gilchrist and Von Bonde, Fisher. Marine Biol. Surv. South Africa, Rep. 2o. 3, Spec. Rep. 7, p. 18, 1922 (1924). (Type Paracyttopsis scutatus Gilchrist and Von Bonde, monotypic.)

Body deeply ovoid, compressed. Head large, deep. Snout deep, subvertical. Eye large, high, slightly posterior. Mouth low, scarcely inclined. Maxillary low, little inclined, reaches below eye. Upper lip broad. Teeth small, in bands in jaws, somewhat larger on women. Supraorbital ridge serrated its entire length. Scales fine, cycloid, without enlarged

tubercles. Lateral line complete. Bony plates at bases of dorsal and anal (not shown on figure). Breast not sharply keeled, with only 2 weak and 2 strong spines. No carinated spinous bucklers from throat to vent. Dorsal with 7 rather short strong spines, highest little longer than soft fin. Anal with 2 short spines, soft fin like soft dorsal. Caudal moderate. Pectoral small, base level with lower eye edge. Ventral large, without spine and with 10 rays.

One species.

Paracyttopsis scutatus Gilchrist and Von Bonde

Paracyttopsis scutatus Gilchrist and Von Bonde, Fisher. Marine Biol. Surv. South Africa, Rep. No. 3, Spec. Rep. 7, p. 18, pl. 5, 1922 (1924) (type locality, Natal coast, 226 fathoms). — Barnard, Ann. South Afric. Mus., vol. 21, pt. 1, p. 378, June 1925 (type).

Depth 1 3/4; head 3. Snout 1 2/3 in head; eye 2, 1/5 in snout; maxillary reaches 2/3 in eye, length 1 1/3 in head; interorbital bony, flat; preopercle edge very slight curve; preorbital depth 1/6 in eye.

Scales 84 in lateral line. Small scales on cheeks (not shown on figure). Median line from isthmus with 2 strong spines and 2 small ones, - only with weak keel. Pliable scute above pectoral base. in head,

D. VII, 28, second spine 1 7/8, fin height 3 1/4; A. II, 29, soft fin height 2 1/3; caudal 1 1/2, convex behind, least depth of caudal peduncle 5; pectoral 2, rays 14; ventral rays 10, fin

France, vol. 37, 1911, p. 229 (Fort Dauphin, Madagascar). — Zugmayer, Abhandel. Kon. Bayer. Akad. Wiss., Math.-phys. Klasse, vol. 26, pt. 6, 1913, p. 11 (Mekran).

Chrysophrys sarba Rüppell, Neue Wirbelth., Fische, p. 110, pl. 28, fig. 1 (Red Sea). — Jouan, Mém. Soc. Sci. Nat. Cherbourg, Series 2, vol. 3, 1865, p. 261 (Hong Kong).

Pagrus (Chrysophrys) sarba Klunzinger, Fische Roth. Meer., 1884, p. 43 (Kosseir).

Pagrus bufonites Lacépède, Hist. Nat. Poiss., vol. 4, 1802, pp. 47, 141, pl. 2, fig. 3. Great Equinoxial Ocean.

Pagrus spinicens Lacépède, Hist. Nat. Poiss., vol. 4, 1802, pp. 47, 141. Great Equinoxial Ocean (vol. 3, 1802, pl. 26, fig. 3).

length 2 1/2 in fish without caudal, all rays branched. Light gray, Ventrals blackish. Length 125 mm. (Gilchrist and Von Bonde.)

South Africa. In the description "mandible" projects beyond upper jaw" though the figure shows the lower jaw shorter than the upper.

vol. 2, 1862, p. 25. 1/m Kner, Reise
Novara, Fische, 1865, p. 58 (East
Indies). 1/m Playfair, Fishes of Zanzibar,
1866, p. 45 (Zanzibar). 1/m Day, Fishes of
India, pt. 4, 1875, p. 142, pl. 34, fig. 6
(Madras). 1/m Casteln au, Proc. Lin. Soc.
New South Wales, vol. 3, 1878, p. (350)
373 (Port Jackson). 1/m Günther, Philos.
Trans. Roy. Soc. London, vol. 168, 1879,
p. 471 (Rodriguez). 1/m Boulenger, Proc.
Zool. Soc. London, 1887, p. 659 (Muscat).
1/m Day, Fauna British India, Fishes,
vol. 2, 1889, p. 47. 1/m Vaillant, Hist. hat.
Madagascar, 1891, p. 195, pl. 25 c, fig. 3
(Madagascar). 1/m Ogilby, Fishes of
Australia, 1906, p. 125 (Queensland,
New South Wales). 1/m Pellegrin, Bull.
Mus. Hist. hat., Paris, vol. 13, 1907, p. 203 (Baie
de Tuléar, Madagascar); Bull. Soc. Zool.
1/m Klunzinger, Verhandel. zool. botan. Gesell. Wien,
vol. 20, 1870, p. 707 (Red Sea).

Genus Stethopristes Gilbert

Stethopristes Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, p. 622, 1903 (1905). (Type Stethopristes eos Gilbert, monotypic.)

Body deeply ovoid, compressed. Head moderate, deep, compressed. Snout moderate. Eye high, median in head. Mouth moderate, inclined, low, lower jaw slightly protruded. Maxillary reaches bellow eye. Teeth minute, in narrow bands in jaws, on vomer. Gill membranes form free fold across throat. Gills $3\frac{1}{2}$, gill filaments short, no slit behind last arch. Gill rakers short, barely movable. Pseudobranchiae well developed. Scales very small, cycloid, smooth, Cheeks scaly, head otherwise naked. No enlarged scales along dorsal and anal fin bases. Median line of breast and belly before vent with series of large strongly keeled plates, keel bearing 2 or 3 backwardly directed compressed spines. Lateral line complete. One dorsal, spinous portion low and short. Anal with

across preorbital. Inside mouth and premaxillary membranes scarlet. Fins vermilion. Pectoral axil bright vermilion. [6344.] Olivaceous above, dark silvery below and side more or less washed brassy with 6 transverse bronze orange bands. Supraorbital and suborbital regions somewhat crimson. Preopercle and opercular margins crimson. Head with yellowish shades below. Dorsal and caudal vermilion, other fins yellowish. Anal very pale orange terminally. Pectoral bright yellow.

single short spine and few more soft rays than in soft dorsal. Caudal rounded behind. Pectoral small, short, median in body depth. Ventral inserted slightly before pectoral, enlarged, elongate.

eye, feebly convex, low; preopercle edge entire or feebly crenulate; preorbital depth 2 3/4 in eye. Gill rakers 4 or 5 + 8 or 9, short, claviform, 6 to 6 1/3 in eye.

Scales 49 to 51 in lateral line; 3 above, 10 below, predorsal extend forward half way in eye, 3 rows on cheek to preopercle ridge and flange broadly naked.

D. X, 9, fifth spine 2 1/5 to 2 1/3 in head, first ray 2 1/5; A. III, 7, third spine 3 in head, first ray 3, last ray 2 4/5; least depth of caudal peduncle 3 1/5; pectoral 1 1/3; ventral 1 1/2; caudal, to end of lower lobe 1 1/3, upper lobe ending in long filament.

Red above, sides rose pink, belly pearl white. Yellow lateral band from opercle to upper caudal

Stethopristes eos Gilbert

Stethopristes eos Gilbert, Bull. U.S. Fish Comm., vol. 23, pt. 2, p. 622, fig. 241, 1903 (1905) (type locality, Pailolo Channel, between Molokai and Maui, 284 to 290 fathoms).—Fowler, Mem. Bishop Mus., vol. 10, p. 96, 1928 (compiled).

Depth 1 7/8; head 2 1/3. Snout 2 3/4 in head from snout tip; eye 2 2/5, slightly greater than snout or interorbital; maxillary reaches 1/3 in eye, expansion 2/3 in eye, length 2 in head from snout tip; interorbital low, flat; preorbital depth 2 in eye; preopercle with hind edge as shallow curve, nearly vertical. Gill rakers 9.

cat 29 Synagris aurifilum (Agilby)

Pentapus aurifilum Agilby, Proc. Roy. Soc. Queensland, vol. 23, 1910, p. 93. South Queensland, 13 to 70 fathoms; Mem. Queensland Mus., vol. 5, 1916, p. 161, pl. 20 (Queensland).

hemipterus (Euthygoptoroma) aurifilum Waite, Biolog. Res. Endeavour, vol. 4, pt. 4, October 31, 1916, p. 184 (13 miles south west North Reef, Queensland, 70 fathoms).

Depth 3 to 3 3/4; head 3 1/3 to 3 3/5, width 1 2/3, upper profile inclined, snout 3 1/5 to 3 1/3 in head; eye 2 3/5 to 3, little greater than snout or interorbital; maxillary reaches eye, expansion 2 2/3 in eye, length 2 9/10 to 3 1/10 in head; jaws equal, 3 pairs of small upper canines, outer largest, mandibular vertical; interorbital 1 1/3 to 1 2/5 in

Scales about 100 counted along lateral line to caudal base and 6 more on latter; tubes 75 in lateral line to caudal base and 3 more on latter; 11 scales above lateral line to spinous dorsal origin, 60 below to spinous anal origin, 26 vertically on cheek. Abdominal scutes 10, or 11, 10, of which 3 anterior small.

D. VII, 26, I or 27, I, second spine 3 1/2 in total head length, twentieth ray 3 1/5; A. I, 29, I, twentieth ray 2 3/4; caudal 1 9/10, convex behind; least depth of caudal peduncle 5 4/5; pectoral 2 4/5, rays 14; ventral rays I, 9, fin 2 1/5 in fish without caudal.

Silvery, with more or less pale rose tints in life.

dividing on side of head, front branch entering eye and passing obliquely backwards to unite with posterior branch, which passed downwards along preopercular border; all scales between branches dark chestnut brown, in strong contrast with rest of head and trunk. Fins colourless. Length to 325 mm.

Queensland.

(Ogilby.)

Hawaiian Islands.

U. S. N. M., No. 51626. Mokuhooniki Islet, lat. 64°30'S., long. 9.1 W., Pailolo Channel, between Molokai and Maui Islands. Sts 284 to 290 fathoms. April 10, 1902. Albatross Collection (D. 3867). Length 130 mm. Type.

preopercle edge crenulated. Gill rakers 3+5, very short and stout.

Scales 48 above along lateral line; 6 above, 15 or 16 below; 4 rows on cheek; 8 predorsal (shown on figure).

D. X, 10, I, third spine 3 3/5 in head, fifth ray 2 1/10; A. III, 10, I, third spine 3 2/3, fifth ray 2 4/5; caudal 1 1/5, emarginate; least depth of caudal peduncle 3 1/10; pectoral 1 1/5; ventral 1 1/3.

Light brown above lateral line, each scale with narrow border and often basal spot of darker brown. Sides and belly silvery, middle area of upper sides from beneath middle to some distance behind depressed pectoral sometimes with obscure dusky bands. Head above dull violet, deepening to lead color on snout. Cheeks and opercle silvery, washed with gold. Broad milky white nuchal collar,

Genus Capromimus Gill

Capromimus Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 123, 1893. (Type Platystethus abbreviatus Hector, orthotypic.)

~~Body very deeply rhomboid, high as long. Head large. Snout rather long. Eye high, in posterior part of head. Mouth superiorly terminal,~~ Compressed.

Body rhomboid, compressed. Head rather large. Snout moderate. Eye large. Mouth large, subvertical, lower jaw protruding, its lower edge serrated. Scales very small. Lateral line complete. Abdominal ridge with row of rough scales. Dorsal with 7 low spines and soft

fin gradually elevated posteriorly. Anal with 2 short spines, soft fin ~~like~~ like soft dorsal. Caudal moderate, Pectoral small. Ventral larger.

One species. In the presence of a row of rough scales along the abdominal ridge apparently allied with Paracyttopsis and Stethopristes.

A.N.S.P.

607a

53038. Durban Bay, Natal.

H. W. Bell Marley. 1925. Length 270 mm.

As Sparus natalensis.

5039 A.N.S.P. Natal coast. H. W. Bell

Marley. Length 238 mm. As Sparus robinsoni.

53085 A.N.S.P. Natal coast. H. W.

Bell Marley. Length 120 mm.

53105 A.N.S.P. Delagoa Bay, Portuguese

East Africa. H. W. Bell Marley. July 1923.

Length 150 mm. As Diplodus microfasciatus.

Capromimus abbreviatus (Hector)

Platystethus abbreviatus Hector, Trans. New Zealand Inst., vol. 7, p. 247, pl. 11, July 1875 (type locality, off Cape Farewell, 400 fathoms).

Capros abbreviatus Hector, Trans. New Zealand Inst., vol. 9, p. 465, 18 (

Cyttus abbreviatus Günther, Rep. Voy. Challenger, vol. 1, pt. 6, p. 26, 1880 (off New Zealand, 275 fathoms).

— Hutton, Trans. New Zealand Inst., vol. 22, p. 279, 18 .

Capromimus abbreviatus Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 115 (123), 1893 (reference). — Waite, Rec. Canterbury Mus., vol. 1, no. 1, p. 26, April 25, 1907 (reference).

Depth 1 2/5; head 2 1/4, width 2 1/2. Snout 2 1/2 in head from snout tip; eye 2 2/5, subequal with snout; maxillary subvertical, reaches 1/2 in snout, length 2 1/4 in head from snout tip; interorbital 2 1/2, low.

Scales 80 in lateral line; 6 above, 20 below. Scales very narrow, rough. Cheek scaly. Lateral line arched high anteriorly, median on tail behind and on caudal peduncle. Dorsal with 26 oblique spinous scales basally, anal with 20, each with 4 minute spines. Abdominal ridge from isthmus to anal with 18 rough scales.

D. VII, 26, second spine 2 1/5 in total head length, soft

where with bright silvery white reflections, brassy in alcohol specimens. Each row of scales on back and upper sides often showing dark longitudinal band, median on each scale row. Iris white with silvery, often neutral shade above. Dorsal pale or grayish, membranes brownish terminally. Caudal grayish, hind edge dusky. Other fins all pale or whitish.

Red Sea, Arabia, Portuguese East Africa, Zululand, Natal, Cape Colony, Madagascar, Mauritius, India, Ceylon, Philippines, China, Formosa, Japan, Queensland, New South Wales.

dorsal height 3; A. II, 26, spines short, soft fin height 3; caudal 1 7/8, slightly convex behind; least depth of caudal peduncle 6 1/2; pectoral 3, rays 16; ventral rays I, 6, fin 2 1/10 in total head length.

Silvery. Black crescent behind pectoral. Black line along dorsal and anal bases and patch on caudal base.

Length 75 mm. (Hector.)

New Zealand.

2 2/3 in gill filaments, which 1 2/5 in eye.

Scales 53 to 57 in lateral line to caudal base and 2 to 10 more on latter; 5 to 8 above, 12 to 14 below, 21 to 30 predorsal forward opposite eye center, 5 or 6 rows across cheek to preopercle ridge. Scales with 13 to 15 basal radiating striae; 40 obsolete apical points with 2 or 3 transverse rows of basal elements; circuli fine.

D. XI, 12, I or 13, I, fourth spine 1 7/10 to 2 in head, first ray 2 1/2 to 2 4/5; A. III, 11, I or 12, I, second spine 2 1/4 to 3 1/4, first ray 2 1/3 to 3 1/3; caudal 1 to 1 1/5, well forked; least depth of caudal peduncle 2 1/2 to 2 3/4; ventral 1 1/4 to 1 2/5; pectoral 2 1/3 to 3 1/4 in combined head and body to caudal base.

Back pale olivaceous to brownish, sides and under surface white, every-

Genus Dreoxoma Cuvier

Dreoxoma Cuvier, Hist. Nat. Pois., vol. 4, p. 515, 1829. (Type Dreoxoma atlanticum Cuvier, monotypic.)

Body compressed, deeply ovoid, lower profile more convex. Head moderate, compressed. Snout short. Eye large, high, lateral, nearly median in length of head. Mouth protractile, cleft subvertical, jaws equal. Maxillary scarcely reaches eye, with closed mouth. Dentary extends down to acute angle. Teeth only in lower jaw, as narrow band, extremely small, villiform; also on vomer, none on palatines or tongue. Nostrils close together, before upper front eye edge. Interorbital flat. Preopercle

very oblique. Ridge across opercle. Gills 4, small orifice behind fourth. Pseudobranchiae present. Scales not imbricated; minute on interorbital; small on cheeks, opercles, upper and hinder parts of body; larger behind opercles and on sides of body and tubercular on ventral surfaces. Lateral line complete. Numerous, large, conical, bony protuberances; pair each side above arch of lateral line; other series of 5 pairs each side below and 3 pairs of much smaller ones. Dorsal with 6 short spines, shorter than soft rays. Anal with 3 very short spines, soft fin higher posteriorly and like soft-dorsal. Caudal moderate. Pectoral rounded, short. Ventral inserted below hind part of eye, with rather long slender

spine and 7 branched rays, little longer than pectorals.

These curious little fishes, remarkable for the conical swellings are known from several ~~specimens~~ small specimens only. The type was but 33 mm long, and though Waite's example noticed above, was much larger it still bears the curious cones. Boulenger thought ~~Hypselotriton~~ Allocyttus likely the adult form, though Mr Cullock's contention otherwise in view of the lack of intermediate materials, seems most plausible.

Chrysophrys lunifrons. Castelnau, Mém. Poiss. Afrique Australe, 1861, p. 21 (East and south coast, Table, Algoa, Vlmin's and Kaik Bays).

Sagellus afer Lappe, Synopsis Edible Fish Cape, 1853, p. 20. Cape of Good Hope.

1/2 Castelnau, Mém. Poiss. Afrique Australe, 1861, p. 27 (Table Bay; Algoa Bay?).

? Pagellus armatus Castelnau, Mém. Poiss. Afrique Australe, 1861, p. 27. Cape of Good Hope.

Depth 2 3/5; head 2 5/6, width. Snout 2 2/5 in head; eye 3 3/5; maxillary not quite to eye, length 2 7/8 in head; 4 canines above, 6 below; jaws with bands of fine teeth forward, short and biserial posteriorly, with niner molar and outer lower conic; interorbital 3 2/3, slightly convex. Gill rakers 8+12, lanceolate.

Dreoroma atlanticum Cuvier

Dreoroma atlanticum Cuvier, Hist. Nat. Poiss., vol. 4, p. 515, 1829 (type locality, "l'océan Atlantique" — Collection Péron). — Günther, Cat. Fish. Brit. Mus., vol. 1, p. 214, 1859 (compiled). — Goode and Bean, Oceanic Ichth., p. 227, fig. in text, 1895 (compiled). — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 2, p. 1662, 1898 (compiled).

— Waite, Trans. New Zealand Inst., vol. 44, p. 197, pl. 11, 1911 (June 10, 1912) (Lyall Bay, near Wellington).

— McCulloch, Bull. Res. Endeavour, vol. 2, pt. 3, p. 115, July 3, 1914 (note).

— Jordan, Evermann, Clark, Rep. U. S. Comm. Fisher., 1928 (1930), pt. 2, p. 232, (reference).

— Holt and Byrne, Ann. Mag. Nat. Hist., ser. 8, vol. 1, p. 89, 1908 (note).

Dreoxoma roniferum Cuvier, Hist. Nat. Poiss., atlas 1, pl. 99, 1829 (type locality, "l'océan Atlantique").

Depth 1 $\frac{2}{5}$; head 2 $\frac{2}{3}$. Snout 2 $\frac{4}{5}$ in head from snout tip; eye 2 $\frac{1}{4}$, greater than snout or interorbital; maxillary subvertical, extends about $\frac{2}{3}$ in snout, length 3 in head from snout tip; ~~eye~~ interorbital low. Gill rakers moderate, bristle like.

Scales 90 in lateral line, which arched high on trunk, becoming axial or median on tail posteriorly and caudal peduncle.

D. VI, 30, second spine 4 in head from snout tip, ~~portion~~ twentieth ray 2 $\frac{2}{3}$; A. III, 28, nineteenth ray 2 $\frac{2}{3}$; caudal 2 $\frac{1}{8}$, convex behind; least depth of

caudal peduncle 5 3/4; pectoral 2, rays 20; ventral I, 7, fin 1 1/3 in head from snout tip.

Brownish yellow, markings forming wide open reticulations, formed of black line merging into bluish gray, which nearly obscures ground color. Membranes of first dorsal and front ventral rays black. Other fins colorless. Length 80 mm. (Waite.

Originally described from the Atlantic Ocean this species has since been found only in New Zealand. Waite's figure shows the jaws apparently a little protruded, so this must be considered in the above account, from which comparative measurements are computed.